Rec^d Jan 18th
Ans febr 16

Bluffton S.C.
7. — 12 Jan '72

Dr. G. Engelmann
My Dr Sir

As the Early blooming of the "Pinus Elliottii" seems a peculiar feature, I've thought it best to send it on, so, that you might observe its ~~—~~ first stages. You will see that it is already very well advanced, — & this in the middle of Jan only! P. australis wh I've told you comes next in order, ~~but~~ ~~this last~~ has only commenced to push! I therefore collected yesterday 2 or 3 specm of P. E—, & the package is already on its way. It contained also in addition a last invoice of seed of P. Ell— & P. glabra, (did you get a package of latter sent in letter before I left here for up-country?) also specm.

My letter is a great mixture — best I can do at this time

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MISSOURI BOTANICAL GARDEN

of Opuntia Pes corvi from the Sand Hills of Hilton Head. We call it here as I told you "Pin Pillow". [An old negro has just sent us from Daw=fuskie Isld the most magnificent (I use the phrase advisedly & not with American Exaggeration!) — bunches of Japonicas, — all double & variously coloured, & some of them of great size, — I shd like you to see them! They grew of course in the open air, — the isld is about 10 miles from here, & fronting the sea — is still milder ~~than~~ perhaps than even this place. Many jonquils also came, — the room now being redolent with their fragrance! I suppose you will have to go into your hot houses for this kind of thing, — but we have bitter weather ~~&~~ here nevertheless at times, to the great astonishment of shivering Northerners, who look only for the gales of Araby the Blest'd when they come South!] I have planted several of the "Pin-pillows" & hope to see them bloom this yr. You will find also in the package a last specn leaf of Y. gloriosa, — this being the pure unadulterated article from Paris Isld, — Port Royal. — On new yrs day going to Beaufort I was caught in a dense fog while crossing Broad River, (a pretty bad place!) & after rowing seemingly for hours we at last struck a ragged isld looming up through the mists & fog banks; — not knowing where we were, we went up "for to see" & inquire of Cuffee. It proved to be Paris Isld wh I had not visited since my early boyhood! — We stopped but for one minute, but during that time I observed some half dozen of Y. glor. — They were similar to those I have observed here, — none of these had bloomed & no fruit. They were growing in the drifting sand along the little beach. Those up the country were taller generally than the few examined here, & were much disposed to branch or fork. The same here; — ~~&~~ also with Draconis. I have to thank you for yr letter of 18 Nov containing such to me interesting notes of the Mel. cactus. No fruit hidden in the wool of my specn, & the central spine is turned upward. I shall watch it with interest & doubtless will be able to send you flrs of the same. I still hope to get fruit of Y. glor. from Hilton Head. When I was away I was called ~~P~~ to the very place (or rather quite near) by sick people ~~[illegible]~~ so that I thus just missed examining the plants wh. formerly grew there. Recd also yr last of 23 Dec — thanks again! Glad the package arrived safely as I was especially anxious you shd see those remarkable specms of Y. filamentosa VERA! You deem me to be "candid" as to my having "picked out" those leaves! Well! I did indeed "pick" out what seemed the largest & best & most luxuriant, — but I can assure you that there was but little difference in the size & appearance of ~~[illegible]~~ most that I saw. There were some 15 or 20 plants, or clusters of plants altogether, & with few exceptions they ~~[illegible]~~ ~~[illegible]~~ corresponded closely with what I sent, — tho' I did "pick" ~~[illegible]~~ 3 leaves from one plant wh. had peculiarly broad & shorter leaves. The others however sent wh were longer & rather sharper pointed & narrower came from another plant close by, & these I regard as simply a good specimen of the Y. fil. as I saw it in Orangeburg ~~Dist~~ County. The lower leaves of Y. f are ~~[illegible]~~ broader, & more obtuse, & invariably shorter, — the younger are narrower & sharper pointed & longer. Those sent mostly came from the second & third tier, — the broader perhaps from first. No! what I sent represents what I saw with but little or no exaggeration! I remarked that these plants clustered more than Y. f. down here. I saw no "thick scaly shoots in the Congaree plant". The day before I left Ft Motte my Father met with a small farmer from the sandy "hill country" (one Brandenburg ya-tha-ya if you take an int. in Teuton names — tho' I believe they mostly call him "Brandy-bug."!) who informed him that there were without doubt (about him) two distinctly marked varieties of Y. fil. Doubtless the one — such as I sent you, — and another perhaps narrower like Dr Hunters. My Father will keep his eye on the said Farmer, who, (so F— says) spoke knowingly & with intelligence in this matter.

J. H. Mellichamp

Recd April 20th
Ans May 15

Bluffton SC

13 ap. '72

Dr. G. Engelmann

My Dr Sir

As you see I have long delayed answering yr. last of 3 6 Feb & for the best of reasons! — I had nothing to send & still less of interest to write you! My kinsman now — even ~~[illegible]~~ on James Isld. whom I had long since anathematised for his seeming neglect of promises made — has just written me, — enclosing flowers & capsules of the "Stiles Point" Y. filamentosa wh. corresponded you may remember with that sent from the region of the Congaree (Ft. Motte). He sys that with him it bloomed "latter part of April", — my earliest here last year (Y f No. 1.) blooming middle of may! I enclose the flowers & capsules sent, — the petals of the former seem to be more narrow than the other varieties, but resembling my Y. f. No 1 in the equal length of the filaments & anthers with the ovary & stigma. The Capsules seem very dif-ferent from any heretofore examined — in being much smaller, & in having much longer re-curved claws (?) at the apex! Possibly however these were plucked when only half ripe, — wh. indeed is most likely! — As for Y. gloriosa! no fruit yet I regret to say! — a sort of phantom or will o' the wisp of the Sand Hills — wh still eludes my careful search! He says that in October 3 or 4 plants were observed in bloom, — the first ~~from~~ being that very vigorous plant from the little sandy beach fronting Charleston, of wh. I formerly wrote you as having a gigantic flower stalk full 6 feet high. This was mutilated by some animal — most probably some wandering gorilla or chimpanzee, — and therefore no fruit! The other plants bloomed on the other side of the isle, but the flowers withered & made no sign & so in this case also — no fruit!

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I enclose leaf & 2 flowers of the James Isld specimen sent me for you to compare with mine also of last fall. Could I take a day on Hilton Head beach I doubt not I could soon satisfy you & myself also. I did get over there last week to see a poor creature almost in extremis — [redacted] — but incessant rain & storm to say nothing of my prof. engagements prevented me from walking the 3 miles across the isl. to get to the beach. The few plants I observed had not bloomed last fall. ———

I shall send by this mail another batch of Yucca flowers wh I came across the other day while overhauling certain Collections of last year. Perhaps it's best that you should have them, tho' I doubt not you can now cry "Enough". I am glad that you are satisfied as to the real bark of the Y. Draconis, but I conclude you have not yet been able to find my "Concentric rings" wh seemed pretty well marked when the tree was first cut — at any rate there was very great regularity in the fibres. ———

The Spring has at last come — even bringing the "Whip poor Will" the last few nights — but we are almost

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a month behind hand compared with last year; — indeed I do not remember to have ever experienced a winter of such steady & persistent cold. I watched to compare the blooming of the pines; & as before found Pinus Elliottii from 3 weeks to a full month a-head of the others. On the 25th of Feb. I observed one tree wh. was discharging its pollen, & by 1. Mch & a little after all seemingly had withered. This did not occur with P. australis &c until about 1. April &c. Mr. Ravenel having requested me to get for Prof Gray certain seeds & plants to be found only on the sea-board I took the liberty of sending him flowering specimens &c of Pinus Elliottii, simply labelling it & referring him to yrself & Mr. R—.

Very
truly
respectfully
yrs
J. H. Mellichamp

P.S.—

Better look narrowly at the Y g. from "Stiles' Point" because it is possible that these flowers may have been incorrectly labelled by my friends. I have re-labelled them, — but just as they came.

J. H. M.

copied

A good many of my P. glabra seeds came up, never over 6 cotyledon leaves — that seems the maximum — one only had 4! P. Elliottii never has over 9 wh. is usual in the vigorously germinating seeds — frequently 7 & 8 — sometimes 6, never under. No seeds of P. australis last year (as I told you in the Spring) to examine cotyledon leaves but there will be thousands this yr. & next! Pourquoi?

Need not send seed — my microscope is too inferior.

Send S. Variolaris!

Bluffton SC
22 May '72

To —
Dr. G. Engelmann

Rec'd May 28th
Ans. June 21

My Dr. Dr. —

I was glad to see once again yr now to me familiar hand, & especially so to find that yr last more critical examination of the Yucca seeds to a certain extent (at least for the present) endorses my own opinion as to the marked differences in my three (certainly two) forms of Y. filamentosa! I shall therefore still continue to trust my eyes & my own conceptions of form & colour &c until corrected by exact botanical

I sent a hastily written letter — containing little of int. to you & a poor return for yr very full & interesting one of Ap 26. but the best I can do at present —

Shall send by mail 1.2.&.3 in order. Very truly H.W.R.

knowledge & the revelations of the Microscope! I am glad to find also that you are now disposed to acknowledge the "Seabrook" plant from the rice-field region as the same as my smooth-long leaved "Pauciflora" — No 2, found about me in this immediate neighbourhood — wh. if I remember aright you were at first disposed to doubt. But I had no doubts myself, tho' I did not see the plants growing — as I informed you. Lest in any way I should mislead you (a difficult matter tho' I opine!!) let me remind you that when you first wrote as to the various Yuccas about me I told you that I knew of but one Y. filamentosa here & failed at first to find a single capsule or seed for you. When I recd the capsule & seed (of No 2) from "Seabrooks" I soon after found both No 1*, No 2 & No 3 (I think) in

MISSOURI BOTANICAL GARDEN, GEORGE ENGELMANN PAPERS

different fields at "Hunting Isle"
^ I labelled them "Salt water" at
first, simply to distinguish those
found ~~here~~ from that found
about fresh water near New River,
& it is among the possibilities
that some of the ~~seeds~~ from
just about me were mixed tho'
I do not know it; ~~The first~~
wh I sent I am pretty certain
came from No 1. ^ This corresponds
with what you say. — I next
found two patches of Nos 2 & 3
growing near each other — indeed
the plants almost touching &
I believe I sent capsules &c
of these also — possibly only
No 2 — as I remember that
those found of No 3 were
mutilated & imperfect. It
was not until last Spring
('71) in ~~first~~ watching the
first shooting up of No 1
& No 2 & No 3 that I sup-
-posed them to be different —
well marked varieties & then it
was that I commenced to
number them ~~accurately~~: It

is only therefore with the a numbers (1.2.3) plants, seeds, &c of Yucca f. that you can be sure of. Those previous may be mixed. ~~[illegible]~~ All this is rather long-winded, but best for accuracy's sake!

"Amicus ~~Plato~~ Sir (as you say) — amicus Engl^{n}; — Sed magis go

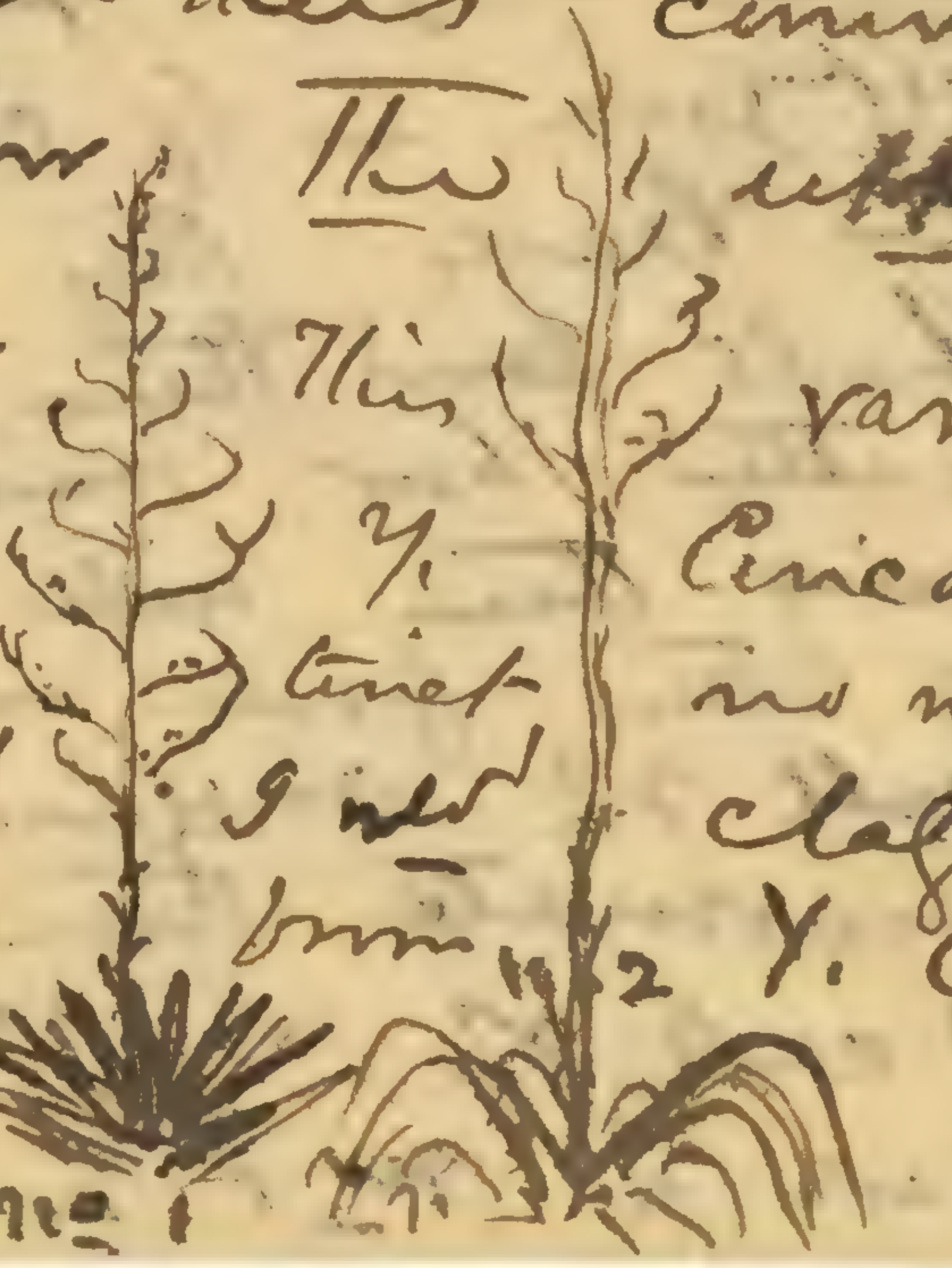
---

I am therefore pretty certain that you have seed of No 1 — The capsules were whiter & thinner & more papery if I mistake not. Last year not a capsule was to be found & only 3 or 4 flowering stalks. A few days since I ~~[illegible]~~ ~~the~~ examined a large patch of No 1 in one of the Hunting Isl^{d} fields which once before I designated to you as "Nanny Creek Field" — the same which was chopped up last spring ('71) by my distinguished friend & countryman — the Hon Cæsar Green. The said Hon gentleman from Africa having totally failed in his little patch of cotton last yr., has now left my yuccas alone "to bourgeon & to bloom", & that they are about doing in a manner wonderful

Recd May 28 1872 (2)

& beautiful to behold! I carried a friend there a few days since; "ah! Dr" said he as he got a sight of it "there's your Asparagus patch"! The plants are very vigorous & much clustered like the broadleaved Ft Motte Yucca, & running up 14 of them to the height of 6 ft & over strong flower stalks wh. are very smooth & of the same pale-green colour as observed last Spring at the other patches 1/2 mile & 2 or 3 miles off. No flowers of course ~~yet~~, hardly for 10 days yet, but it will be a sight worth seeing when they are in full bloom, for the panicle of this variety (as I told you) is much more compact(?) than the others commencing to branch even below the upper half of the scape.

may be the same as
but it seems to me dis-
what the seeds say; tho'
it as next in order
I have therefore the
promise of getting good



This
Y.
tinct
I now
form

variety
Cenicarous
no matter
class
Y. C.

capsules from these late in the summer. I also visited another patch of No 1 at "Buck Isle" & observed the same conditions. All the other clusters of Nos 2 & 3 have gone to sleep — indeed have almost disappeared, so I know not that I can get seeds this year. You ask about the Capsules of *No 3, I am sure it ~~[illegible]~~ was sent & correctly labelled. But I feel less sure of No 3 (as being distinct) — yet the leaves are generally thinner & smaller & coarser & the stalk soft prickled invariably it seems to me. You ask about transition varieties of No 1 &c I must confess I have occasionally ~~seen~~ plants especially younger ones & growing in unfavourable situations wh I failed to "spot" with certainty — was doubtful somewhat where they belonged whether to No 1, 2 or 3 — this for the truth's sake & opt. I am pretty well assured of the marked distinctions I've so often reiterated to you "ad nauseam", I hear you'll say!!!

I have 3 good specimens of 1.2 & 3 collected last year — by cutting off one half of the leaves they are less bulky & I shall send them thro' the mail no matter how mutilated they be as your seeing them will be better than any no of letters from me but you will have to call yr imagination into play to rejuvenate these withered & parched things. I call yr attention to the no of leaves of no 1 & the paucity of no 2!

* The capsule of No 3 sent had commenced to turn black when plucked.

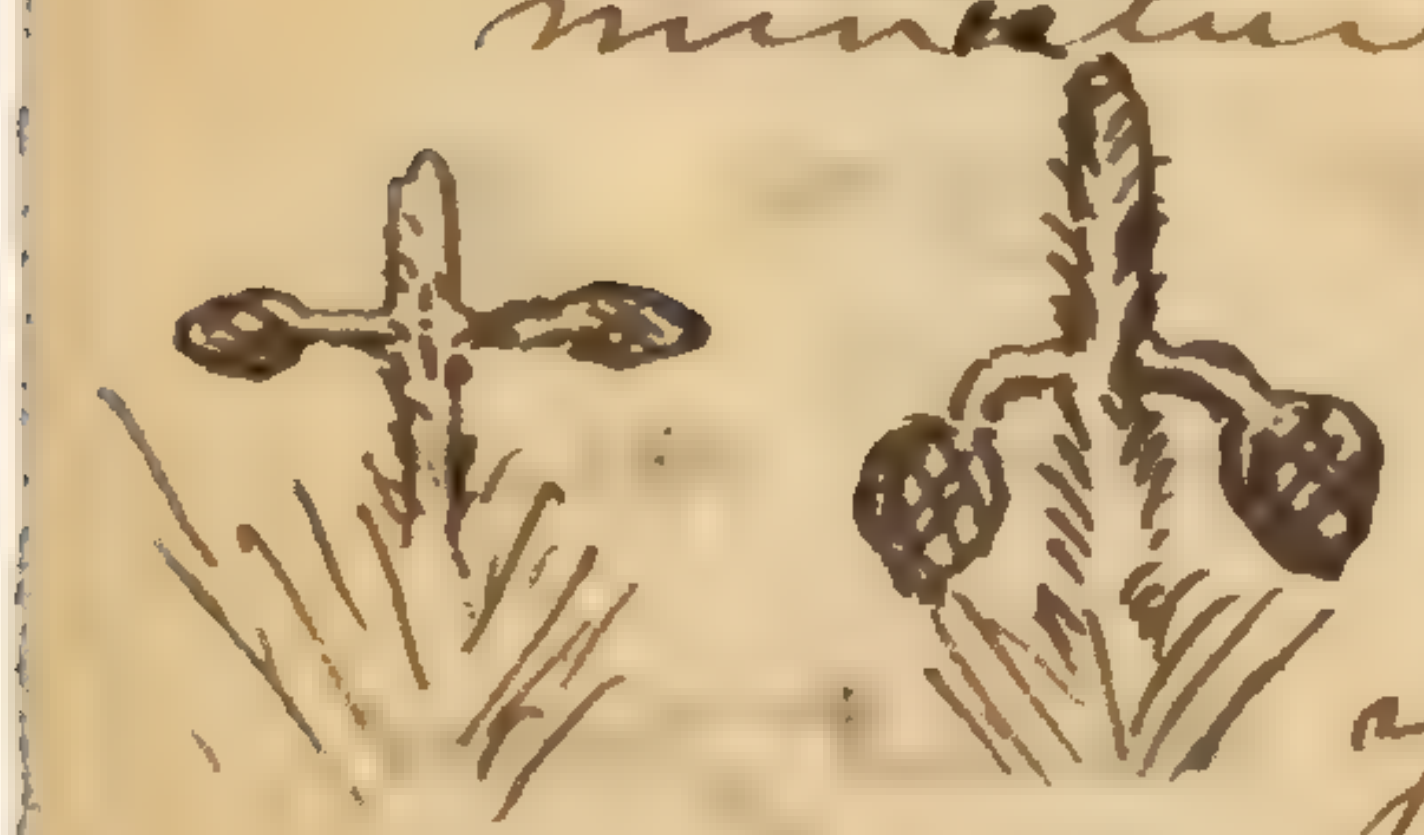
Y. Paucifolia? — no better name! — further the thing is entitled to a species

Rec'd June 4th 1872
Ans Jun 21

(Yucca notes for G.E.—!!)

26. May '72.

Sunday morning! & the day deliciously cool & balmy after the drenching rains of last night!— Saw my only patient, & thought I c'd do no better than walk out to Hunting field & take a look at my "Asparagus Patch" of Yucca (concava?) better known to me as No. 1, growing in the "Nanny Creek field"— from which I failed to obtain flowers last year, the plants having been cut up by the hoe! I pass through thousands (saplings) of Pinus Elliottii, whose young cones of this spring from forming a month or so back little crosses in miniature, are now all strongly re-curved!



& as I enter the field— what was my surprise to find the flower-stalks of yucca No. 1 had leaped at a bound into buds & flowers!— The tender pea-green colour of the scape & branchlets & buds contrasting beautifully with the half opened white bells of the flowers! Why so I know not, but that alliterative line of mine ancient friend Tennyson— (the friend of my youth!) came running into my brain & held fast there,— "And many a milky-belled Amaryllis blew!" "milky belled" in truth, & a goodly sight too!— some 14 scapes all running up together 6 & 8 feet high from a little circle & cluster of smooth & soft but neat green leaves! When quite near & about to examine the flowers saw two odoriferous "Cushites" not far off,

& for the affected nonchalance & indifference with wh I strolled thro' the cluster, — looking neither to the right nor left, but downwards as if in a mood reflective — "meditans in nugas," — or straight a-head & without looking, & as if in pure recklessness twirling my stick & almost taking off the finest panicle there! —— I say for this I deserve not only the thanks of W. E. — but his fervent praise & admiration. And why forsooth? Ah! my W. E., had I stopped a shown admiration or curiosity — or lingered at the charmed spot, ~~to~~ those said sons of Cush, — (Cuffee & Quacco by name we will say!) need most likely have returned to take their look too at what "de Buck-rah man was a-lookin' at," — & out of pure wantonness — not malice, — would have laid waste like wild boars this garden of the Lord! Such things, I have known not once nor twice only, this "man & brother" (and sister too!) of mine to do! So having the fear before my eyes of no further examination of the plants, and no mature capsules & seeds of No 1 to send you, I stalked thro' the field into the one ad-joining yclept of yore "Sageretia field," — if you still keep up with the topography of this land of darkness & desolation! — Here too another surprise was in store for me, for here it is that no 2 (Paucifolia) & no 3 grow almost side by side, — two plants of the former shooting up their stalks of deep purple or claret colour from the centre of their long, smooth, sharp-spined, scattered leaves, — but not yet branching — tho' 5 or 6 feet high, while al-most touching them no 3 had also commenced to push to the height of 6 & 12 inches a goodly number of his shafts, — not pale & tender like buds of asparagus as in No 1, nor soft & purple as in No 2 but "ferox" as we used to say at school, for even thus early the sharp obliquely pointing scape leaves ~~that~~ seemed to fence about & protect the young buds.

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Rec: Jun 4
Ans – 21

My dr E— 31. May —

As I am about to send by this mail No 2 & 3 of last yr — I think it best to send a note informing you, & that No 1 was sent some days ago, & to fill up the letter send also a few random notes of my walk last Sunday — something of a mixture & farrago like the prescriptions of some doctors. Will keep my eye on these things during the

summer, & either send or write if
any thing interesting turns up.
The damp-pine lands have been radiant
with Calopogon Pulchellus & lately
with Helonias & my favourite Pogonia
Divaricata which I believe is not found
with you, shall I send one?
Answered after a fashion June 9 ([illegible]
Ap 26 some 10 days since.

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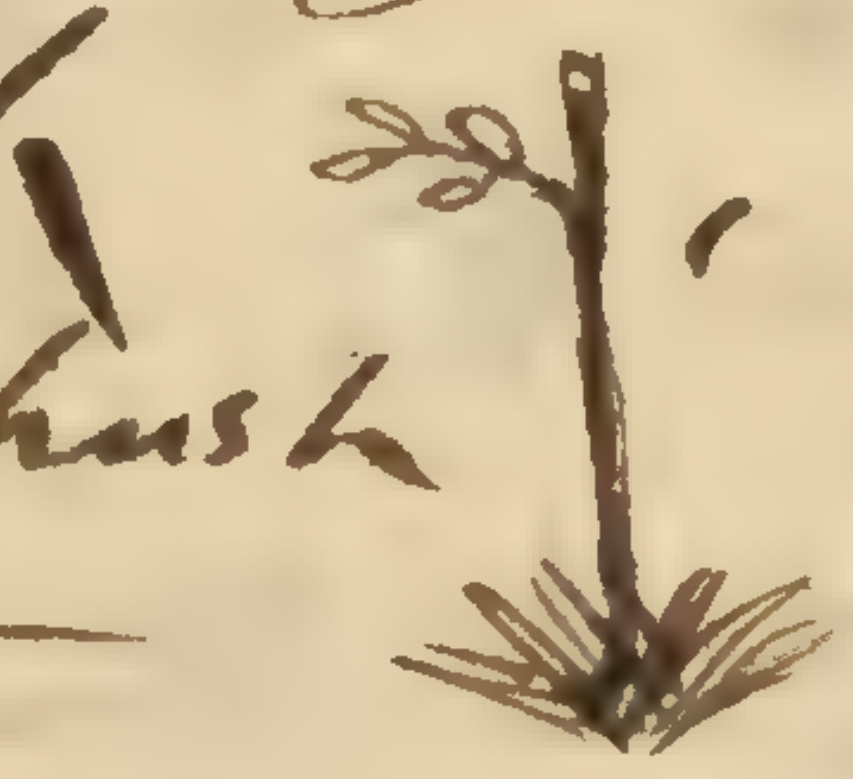
botanicus

Rec June 8 · 1872

(2) I say, possibly almost every flower is impregnated, but some necessarily fail to become sound fruit by the exhaustion of the plant on acct of the vast no of blooms, — & on this point I adduce the following. When these Yuccas were first in bud & bloom I observed one fl stk wh had been partially cropped by some animal; — I cut away all the remaining fls save 3 or 4 on one branch,  thus, — thinking I might push all the vigor of the plant into those few buds, & so get sound capsules with sound seed! Now upon examining this plant I find every fl was fertilized, now becoming capsular, & pedicel turned & erecting itself! Would all of these 3 or 4 blooms (even tho impregnated) have thus side by side run into fruit on a tree covered with flowers? not impossible certainly, — but it is not usual! I also observed another wh had been mutilated, & on this also it seemed to me there were many going into fruit.

Now for another inducement as

to No 3 referred to in "notes" sent off last! In this same field of "Nanny Cr", I had before ob-served a few straggling plants but a few steps off, on the old Cotton beds, wh I was somewhat doubtful of, — whether they belonged to No 2, or 3; — but a robust, bronze-coloured flower stalk, seamed & roughened as last year, — covered with long leaves wh were closely imbricated at the summit — soon declared for No 3! This plant was not over 20 steps off, & about 18 inches high, while fourteen plants of No 1 were in full bloom — all resembling each other in the minutest particular, especially in the pale green flr stalk (assuming now a faint yellowish tinge) & the very long panicle! In the other field not far off ("Sagerettia field") both No 2 & No 3 disport themselves alongside, for the examination of all who chose to look & compare; — No 2 being smooth & purple & about 6 feet high, — just commencing to branch, while a great many of No 3 are just commencing to push as above.

MISSOURI BOTANICAL GARDEN
GEORGE

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GARDEN

2. June

I was curious to see if the patch of *No. 1* at "Buck Isle" were blooming this year (of wh. specimens were sent last yr.), so opportunity offering — I visited the spot, & found some 5 or 6 plants corresponding in all respects with those at "Nanny Cr. field". About a half mile further on, found 2 plants of *No. 3* with stalks full 18 inches, corresponding exactly with all others seen both this yr. & last — all *seamed* & apparently minutely pubescent (rusty) & bronze coloured. The leaves *of* this were wider & longer than any yet seen, but corresponding with the others. Extended my walk to the edge of the wood in rich & mellow soil, where last June I found the very fine specimens of the smooth-long-leaved *No. 2* (*the plant sent last mail!*) & hoping to find a few long, deep purple stalks running up to 8 feet, as I did last yr! But in this I was disappointed, the broom-grass having been burnt, & with it the plants & even the adjoining fence.

The fire had burnt a little on the edge of the wood, exposing—to my very great surprise,—a large cluster of the true *Y. Concava* (No 4) *precisely such* as I found near the Congaree at my Father's!! Some 50 plants in all, & *but a few steps* from *the very diff.t*, smooth,—long leaved,—sharp-spined No 2! Doubt not I sought for blooms,—"carefully"! [illegible] "if not with "tears" but to my great regret no fl. stalk! Now what I wd ask, is this; if the various differences in the Yuccas about me are produced by soil, exposure or non-exposure, —why should these ~~two~~ be so utterly distinct, almost touching each other—as No 2 the long leaved, & No 4 the spoon-shaped?! And I ask the same of No 1 & No 3 in one field, & again No 2 & No 3 in another, & all of them preserving their invariable characteristics! *If they be all one*, then these marked distinctions are produced by other causes than soil, & sun-shine, & shade, & various "skyey influences"! Or are they *Hybrids*?—but if Hybrids then have these varieties or species now become *fixed*! And yet when asked to describe these plants I am sensible of the difficulty of doing so, yet certainly, the flowers,—the arrangement & length of the filaments &c—the stigma &c differ in No 1, 2, & 3,

Rec'd June 8 1879

(3) & so far as No 1 is concerned hold good for this year as last! And I expect to further same hold good also both for No 2 & No 3, and what is more I am confident the Seeds under the microscope will tell the same tale! I do not believe that No 1 & No 4 (Ft Motte) are the same. Now, another matter as to the No of the leaves — I suppose all of these yuccas vary therein, & I doubt if ~~it~~ they be the safest guide! My Fort Motte No 4 was leafy — if I mistake not, some 80 or 85 leaves I believe — or was it less? but those of No 4 just examined at "Buck Isd" were few-leaved, as few as No 2! No 1 is very leafy, — always! generally 100 leaves, sometimes 80 or thereabouts. No 3 is less, from 50 to 75 generally, — most frequently the latter, — but No 2 always so far as I know from 25 to 50. The question is however whether it be invariable enu' to give a name to a plant! Seemingly it is so with Paucifolia wh. name seemed to me most appropriate, but to me the most distinctive feature is the purple flr stalk & the long stemmed - sharp - spined

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lanceolate leaves, — but then Botanists don't believe in Colour. I do! when I see it ~~too~~ so persistent under all varieties of Soil &c about me. I will say that altho' I've examined a great many plants of No 2 both on Hilton Head, & on the main-land, yet, the longest leaves were those sent from "Seabrooks", & "Buck-Isd" (last sent by last mail!):— these are unusually long! Should I send a piece of the stalk of No 3 please test its pubescence &c under the microscope, — wh I think is like Y. gloriosa somewhat. One more — I will state that I have never yet seen a young stem ~~plant~~ pushing *out from between the leaves above ground; — all of these push out from below the ground from the subterranean stem, from a few inches to 2 or 3 feet or more. I believe.

Enou' for the present, — will hardly inflict any more "Notes"(!) on W. E — until after the Capsules &c have been formed of all of them. & the flowers noted!

* of course I've seen it frequently then in Y. gloriosa & Y. Draconis! —

Rec'd June 8
21

3 June, 1872

My D^r Dr.— I send you the enclosed & tho' contrary to Yr injunctions,—must say, that I feel I take somewhat of a liberty in scribbling off such vain repetitions, for one whose time is valuable. This without any the slightest affectation on my part; yet I send them because encouraged by Yr kindness, & with the hope that some random shot from an untrained hand may by chance hit! The beautiful little Kalmia hirsuta now "takes up the wondrous tale" & will gladden the pine-lands & my heart also with memories of a past time, & next the Rhexia glabella & so on through the cycle! — yrs. Aff—

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Recd June 25 1872
Ans July 2d

from Dr J H Mellichamp
Bluffton SC

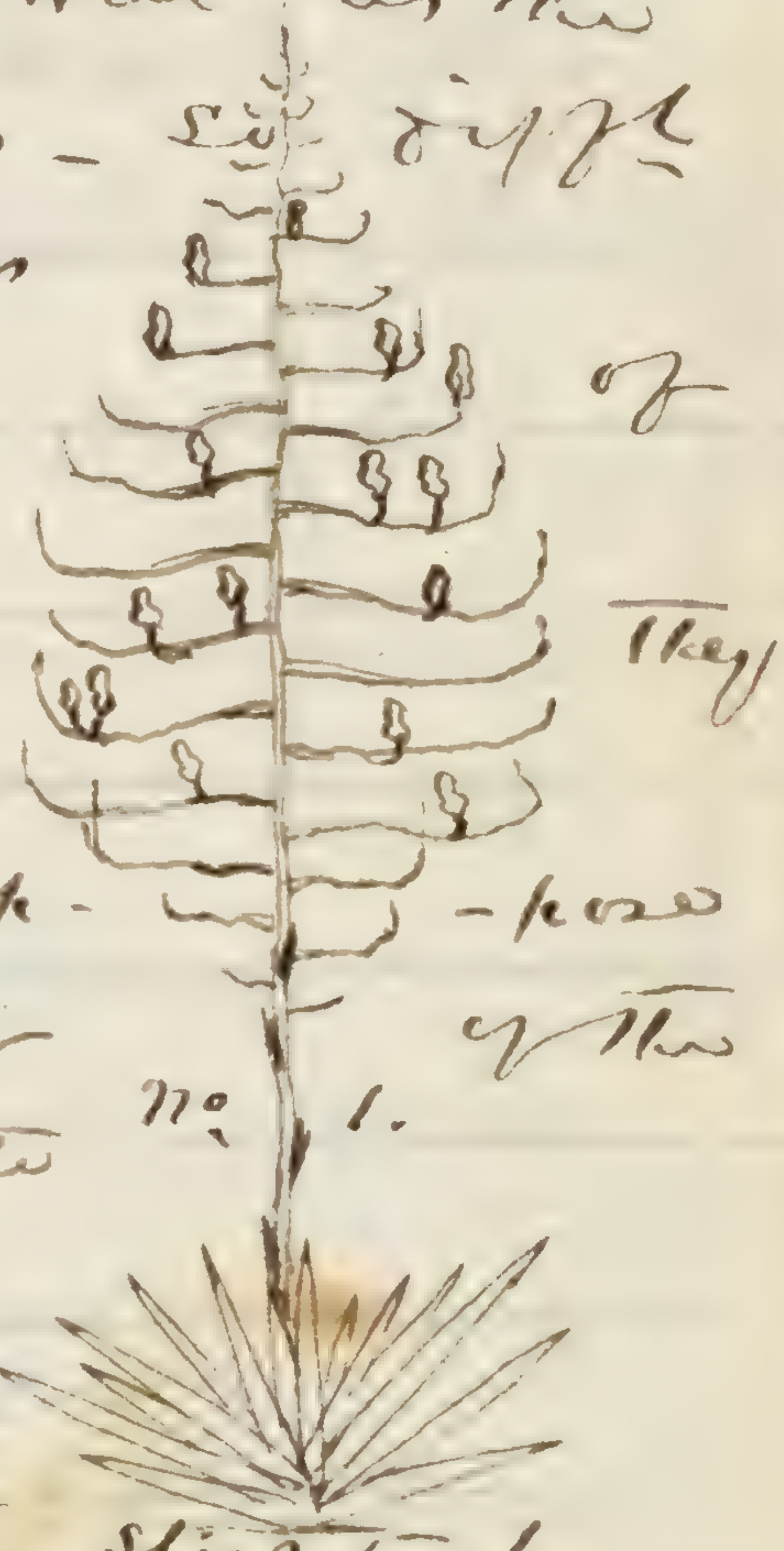
Yucca Notes!

17. June 1872

Examined today the Patch of No 1 at "Nanny Creek" & found the stalks destitute of flowers but full of smooth green capsules; — all of wh. apparently were constricted in the centre

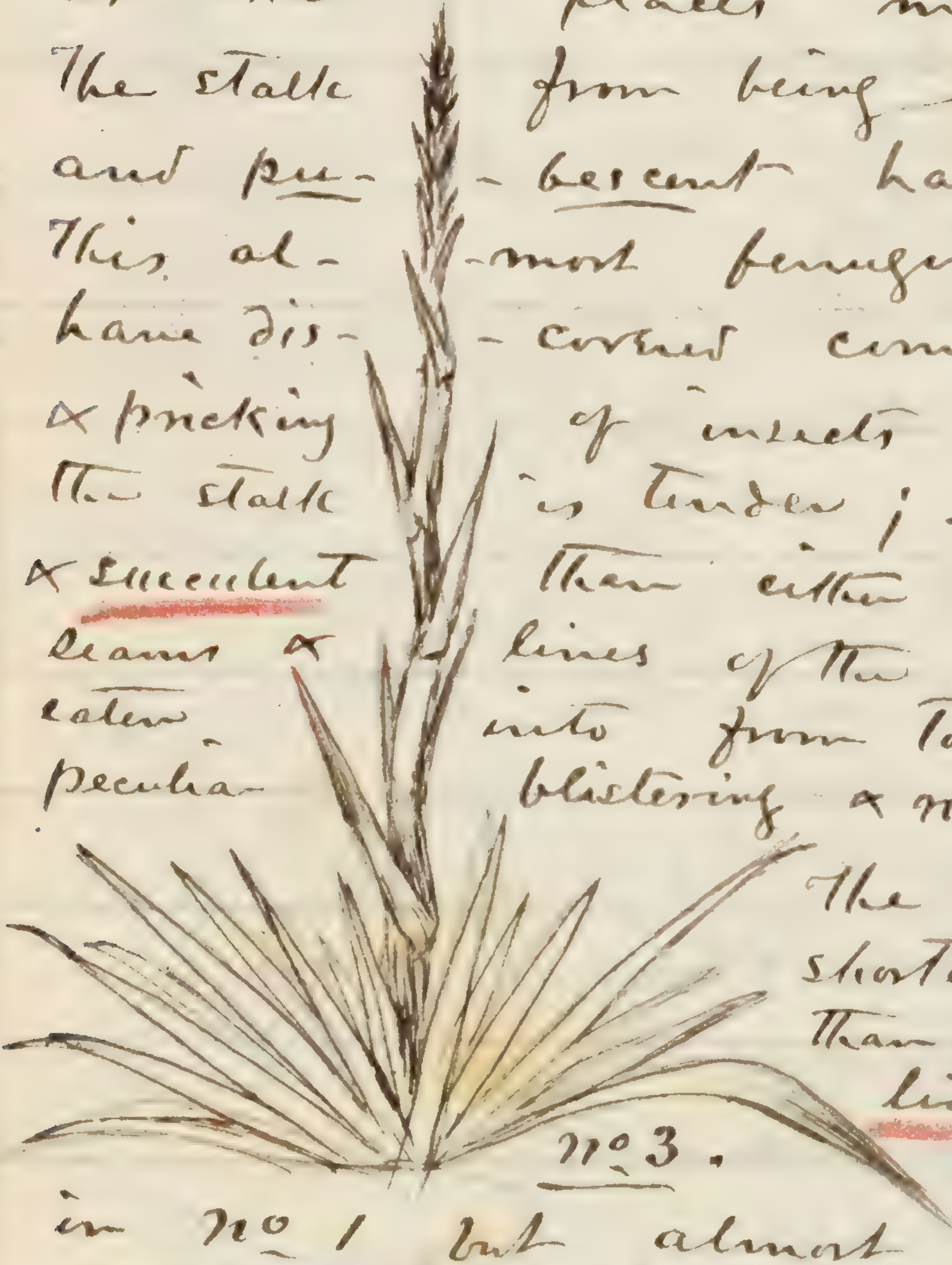
& all of course, this time erect! One stalk especially was much crowded with fruit, & this was the one on wh. I observed so many insects of various kinds — & also the just commencing to wither flowers containing the glistening drops of fluid as before described. Does this serve only to attract the insects or does it assist more materially in the impregnation? I observe pretty much the same thing with the Asclepias Obtusifolia, the erect leaves of the staminal crown being full to overflowing with fluid — wh seemingly attracts beetles &c, & without whose agency probably fecundation is impossible. This only in the mature flowers.

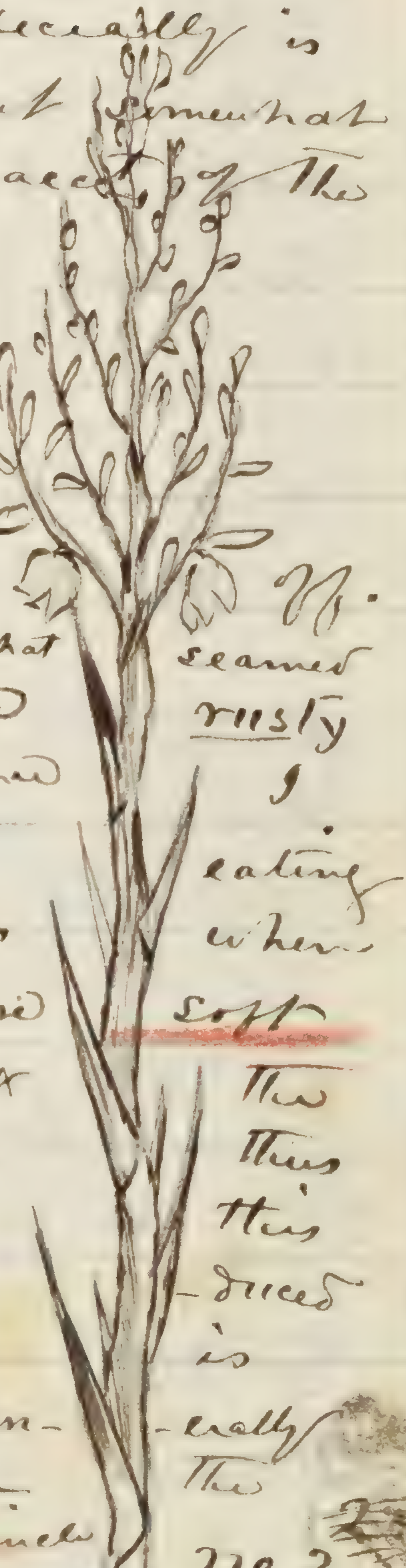
The length & size of the Panicles are now more readily seen, as well as the peculiar growth of the limbs — see diff.t from Nos 2 & 3. The capsules are of a pale green, the colour of the pods of an English Pea & remarkably smooth, neither are they spurred (?) like those sent from Stiles' Pt Jas Isld; — this I suppose is only the elongation & recurving of the stigmas. Would not this indicate a considerable difference between Nos 1 & 4? — but indeed I haven't the slightest idea that they are the same! ——



Not 20 feet off from this Patch of No 1. was the just commencing to bloom flower stalk of No 3 — only a few of the lower blooms having burst; — in 3 or 4 days doubtless it will be in full bloom. Although a very vigorous stalk it was not nearly so tall as No 1, but covered with leaves wh are much longer than either in No 1 or No 2. Indeed this is a characteristic of No 3 always observable from its earliest growth, — the leaves being imbricate when completely concealing the young flower buds — reminding one at this stage of the Artichoke (Cynara Scolymus) — I mean only in the intrication! The stalk of No 3 in its earlier stages especially is not straight like No 1 & No 2 but somewhat twisted — having a jointed look on acct of the protuberant bases of the leaves.

In this plant before me at Nanny Creek I observe the same characteristics as noticed last year at other places many miles N. The stalk from being at first somewhat seamed and pubescent has now become rusty. This almost ferrugineous appearance I have discovered comes from the eating & pricking of insects along the seams when the stalk is tender; — it is more soft & succulent than either No 1. or 2. & the seams & lines of the same being thus eaten into from top to bottom this peculiar blistering & rustiness is produced. The Panicle also is shorter & smaller generally than even No 2 — the limbs of the panicle not spreading wide as in No 1, but almost compressed against the stem as above. [I fear my leaves above are just "a leettle" too extravagant & "ferox", — ^ yet I have seen them thus in the most robust!] Panicle also pubescent, purplish ^ bronzed. Flowers larger than No 1. — not so white nor so delicate, — altogether heavier & coarser, — corresponding also as to stigma — filaments &c with the examinations of last year. I hope to obtain good sound capsules from this plant — wh I expect to be roughish & coarser like last years — & not smooth & pale-green as in its

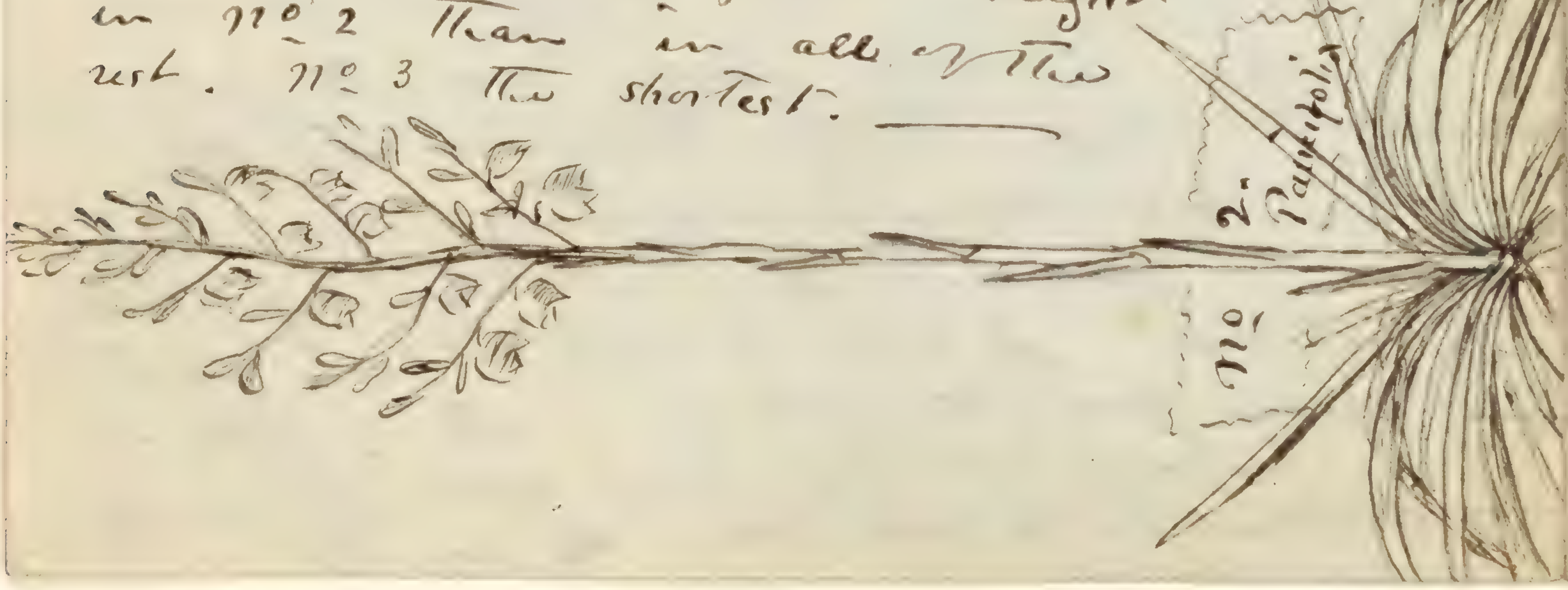

No 3.


No 3

more elegant & delicate neighbour No 1. but a few feet off! ———

I now crossed over to the other field ("Sage-retia"!) to see what had become of the two tall purple stalks of No 2. before mentioned. Both of them (Paucifolia!) were now in full bloom, having far out-stripped their many comrades of No 3 a few feet off – wh however were rampant eno' in their array of spear pointing leaves – but will hardly bloom for 10 days yet. (These latter (No 3) are precisely the same as the other plant just commencing to bloom, – wh has been described at "Nanny Cr.") ———

I find these of No 2 (Paucifolia) in all respects the same as last year, & answering accurately to one of the same wh on the 8th of June of this yr. I found in full bloom at New River 10 miles off – a flower of wh I shall send. Panicle short, but a little more spreading than in No 3 – pubescent but not as markedly so as the latter. Flowers large, precisely the same as No 3, save in the greater elongation of the style of the latter. The stalk usually reaches a greater height in No 2 than in all of the rest. No 3 the shortest. ———



(2) Rec June 25. 1872.

For my own satisfaction I must designate No 1 as Y. Glabra. It is peculiar in its long panicle & the pale green of the stalk — but smoothness is its most peculiar feature — extending to the capsules as well; — therefore Y. glabra henceforth to me is it, no matter what outsiders "Extraneous individuals" may say. No 2 is most appropriately Y. Paucifolia as you suggest — and Y. P— is it to me henceforth — but as for No 3 I am in doubt. It is Pubescent, (Pubescens?) rugose, — sulcate, — ferrugineous, (partly by the help of insects.) but perhaps more especially leafy-stalked, — but such deep matters require much meditation! So let No 3 lie over for a while until you feel satisfied ~~that~~ as to what my my poor plants may be, — — whether only chance "Varieties" — or freaks, — or Species! Nevertheless I shall believe them to be the latter until the Seeds say otherwise, or until it be proven to me that Yuccas vary more than other known plants, & that such Variations depend upon far deeper causes than the poorness or richness of soil or the absence of shade or sun-light; — for I think what I've stated proves — that such influences exert but little effect. As for No 4. I greatly regret that the clumps

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of these lately discovered at Buck Isld. so near the long leaved Paucifolia sent you — bore no flowers, so that I might have seen them all in bloom. I am curious to know whether the stalk, panicle, &c of this (No. 4. Y. Concava) is like No. 1. Y Glabra!) Doubtless they approach each other as Nos. 2. & 3. do, but they may still be as distinct — their leaves at any-rate are different: ——

Last mail I sent the Smooth Capsules of No. 1. ~~by~~ & hope they will reach you safely. & previously, whole plants of No. 1. No. 2. & No. 3. also the leaves of No. 4 (Y. Concava) from Buck-Isld. I have not much to do, [illegible] the sickly season having not yet commenced & so have amused myself by looking after these things & scribbling away!! I am conscious that I harp on the same string & without variations & therefore run the risk of being tiresome. — but you have doubtless much to do, — so if you do not reply until October (by wh. time you will have most likely examined the seeds & capsules of all) I shall be vy well satisfied. Meantime I shall continue to look after them, & if any thing new turns up I shall inform you. But let me myself vy. thank you vy many times for the beautiful specimens of what I take to be P. Strobus — for there was no letter: Is it not P.S? & does it grow in yr. State? I believe dwarfed forms of it are to be found in the Carolina mountains. Terminal — is not this? It reminds me somewhat of an exquisitely beautiful cone of what was labelled "Norwegian Pine" from Ft. Motte S.C. but wh. of course is a Spruce or fir I imagine.

Last letter of yours 26. ap. I believe this is my fourth & ~~they~~ "the cry is — still they come"!

Vy truly yours J. H. M—

Rec Jan 29
ans Feb 12

Bluffton S C
24 Jan '72

To Dr Engelmann

My dear Sir

I had hoped to give you a respite for a time at least from my weekly bulletins, but my father having sent me a little package of Y. Carcapsules (but without a letter) from St Matthews (Ft Motte) I thought it best to send it at once so that you might examine them while green. One of these capsules is larger than the others & bigger [illegible]

Has [illegible] been written in [illegible] as I am told!

You will see on the
sections. those will be
marked xx 1/2 — the
others are the latest
from "N. C." & are
marked No 1 — Please
try them all once
— especially to see what
they say to them now!

At that time I was
having occasion to send
Dr Gray some things
from here & I sent
specimens of an Asclepias
Tuberosa (?) collected last yr &
thus — asking him what
it was. He says "It seems
As. Tub. (?), I think is
a monstrosity, if not it is
a distinct species — Synantherous
South — send some to your friend
Dr Engelmann who listens to these
things" — he did say nothing further
— "he was just getting for
a long vacation journey". Will you
look after it? Yours truly [illegible]

Please excuse scrawl —
I fear illegible — but
compelled to write hurriedly!

Bluffton S.C.
13 July/72

To Dr G Engelmann —

Rec'd July 20,
ans. same day
and July 29

I enclose
ascending scale
of Agave V — .

My Dr Dr,

Last mail I sent you a package containing the very young capsules of No. 3, — also others of No. 1, — also two or three moths captured within the flrs of No. 3, — & one specimen of that foetid bug or beetle which as I've often told you sometimes completely covers a Yucca plant stalk & branches! The moths thus far only found last yr & this on Nos 2 & 3, but the beetle on all the Varieties (!).

A day or two ago while riding thro' a cotton field on Hilton Head I found a patch of No. 2 with pretty well matured capsules, & these I now send, as I wish you to see them green. You will observe their lack of constriction of the base, their more oval form, & the faint tinge of Pink or Purple wh some of them assume — also their greater size than all the others I have thus far observed! ——

I have only thanks to give you for your most obliging & instructive letters (2) in reference to the impregnation of Y. & your own satisfactory Experiments, as well as your acceptance of my "A. Tut.

-nosa"? as a good species of Acerates! & now yesterday your note & the beautiful specimens of Pine! Many thanks for yr kindness! When last I visited the patch of No 3 they were already running most abundantly into fruit, but on a few of the remaining flowers I attempted yr plan by forcing the pollen grains into the tube. I marked them & await the result — as for the other Experiment I doubt if I cd accomplish anything with so inferior a magnifying glass as I have — & indeed I have been too busy lately. ———

I confess to some surprise that you shd not have endorsed Prof Gray's dictum of my "A. Tub.?" being a monstrosity! When I found the plant last year surrounded by ~~hundreds~~ many of the true A. Tuberosa, & observing the resemblance of the leaves &c to the latter I was disposed to look upon it as some freak of Nature — for I have never failed from year to year to keep a bright look out for anything new ~~[illegible]~~ in that Especial family, — for wh I have always had a decided weakness. I however marked the spot, pressed the plants & wrote off the notes sent you (in part) & also made a rough drawing of the flower, gynostegium, & buds &c.

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This year I found the same plant in bloom, & on the edge of the Cotton field about 20 feet off across a ditch & bank, another & still more vigorous plant — in all respects similar. But these are the only 2 plants I have ever seen! I fancy they may be the only two on the globe! — for I cannot see how such a species ~~that~~ shld have so long escaped me new if at all diffused. Your reference to the genus made me laugh —

"'Tis sweet to see one's name in Print
All tho' there's nothing in't" !!

But seriously, as regards the naming of Plants they should bear I've always thought either ~~any~~ the names of Scientific Botanists (not dabblers & collectors like myself) or, such combinations (if good Latin shld be used) & as most accurately describe some distinctive & peculiar feature, & this last I think preferable. If it be an Acerates (& it must be if you say so!) A Steenfit would be very accurate it seems. It did not go into fruit last year, if it does this I'll send it. If I thought I cld get the root on to you this fall in good condition I'd send it & let you see it in its beauty for yrself. I think it really orna-mental & A. Sanguinea is also good & sounds better!

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Yucca I'm getting to think is an elusive kind of a Phantom, or like the Irishman's flea when you think "you've got him" — he's gone! I observe the partition walls between the seeds in No 2 are not always to be found tho' generally so,! nor are the leaves invariably long. Sometimes, after they sprout up in a field after having been often ~~[illegible]~~ chopped the leaves are short, but give them time & the length is remarkable. Y. Longifolia is correct — but by comparison with other Yuccas Pauciflora is I suspect more so. I have collected a good many ~~p~~ capsules wh are full of worms (the same I imagine with those sent you) they have been carefully fixed up in a covered tumbler & I hope to report result. I fancy however that my odoriferous friend may have a hand in this matter of impregnation.

And now lastly about the Pines — I thank you very much & I see what Apical means. None of ours are so, except occasionally in non vigorous ~~st~~ branches. But I don't think anything touches my Australis & I was thinking today when jogging mule-back thro' a Pine-land that your short two leaved Austrian & Scotch wd hardly give such a susurrus, when the wind takes their topmost branches! ~~[illegible]~~ When a child, ~~[illegible]~~ living in the Pine-lands, I never tire of this "Cathedral music" & the older I get the better I like it! Your small fruit ~~of Y. Pubescens~~ is very much like my No 1 & No 4 also I think, but the other Y Pubes? is very familiar. No Y. Draconis just about me in bloom but I saw several on H Hd. I shall try & find out about the erection of the fruit when young. I cd learn nothing from those I saw wh were just blooming.

Vy truly yrs H——

Rec^d July 20 1872

In last package I sent a good specimen, in fruit of "Bletia Aphylla" wh delighted me when I first saw it springing up under the live oaks! — never saw it here before the war, nor its predecessor of April Corallorhiza! I welcome all new-comers — except Carpet baggers! I enclose what I take to be Zigadenus glab. wh I found in a damp pine-land to day. Please say if it be Z. g. when you write again in Nov or Dec — also Lyonia Maritima wh I believe I sent you before. This was growing on an old marsh mud causeway wh had become covered with rushes & saline grasses. I like it because it ranges under the Asclepiad bed! Also flower of the common ~~Cactus~~ Opuntia

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& another wh. I take to be a Mammillaria from the garden of a friend. Last year I procured from the Sand Hills of Hilton Hd. plants of ~~the~~ O. Pes Corv & planted them for the purpose of observing their flrs. But although there are many plants & they are growing beautifully, no bloom has appeared.

I never saw the flr & never saw any man who had!

If you will take care of the Capsules of No. 2 (Pauci-folia!) you will be able to satisfy yrself whether the worm is the larva of the moth sent before - unless crushed in the mail. Will send No. 3 when more mature.

LH

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Yuccae from Dr Mellichamp

1. 5, 1872 July & Aug. ripe & unripe Capsules! flowers
4. " Nanny Creek 1 June leaves & young caps.;
leaves stiff filamentose involute
3 " Leafbranch, whole plant. leaves a little more acute
1. 1871. Jan. Huntings island old capsule, no dissepiments
leaves same as above old stalk
2. 15–20 May. in flower! — [illegible] same as above
[illegible]

4. 6 1872 1 June. [illegible] leaves
1. 1871 Jan. stiller fruit capsules long rostrate, harder, rougher, more dissepiment than No 1 old stalk
2 { End of April flowers, same locality leaves
3 } April 71 leaves Trimbleston plantation
1871 Jan Orangeburg Co leaf tips
5 Dec Congaree, leaves
4 Aug Fort Motte young plant with 5 petaled lea
7. 1872 Jan & young fruit

2. 7. 1872 Hilton Head Capsules, green
bunch of leaves —
6 Jan leaves, long (stout) point —
somewhat fibrous — [illegible]
5 1871 Sept Capsules, old stalk.
4 June 1–13 flowers & Caps Huntings island
3 Febr old Capsules Huntings island
2. Jan Potatoe island leaves
1. 1870 Dec Seabrook's Capsules & leaves

leaves rough in 1. 4 when dry
smooth in 2, but firm
— 3 — —

Respectfully
J. G. [illegible]

St Louis July 17/72

Doct. Engelmann

D^r Sir

I wrote you a few lines a couple of days ago, stating that the Salve had increased inflamation &c and that my wife awaited your instructions in regard to its further use – Not having heard from you I take this method of writing again. and would ask your advice –

Respectfully

J. C. Harding

leaves rough in 1. 4 when dry
smooth in 2, but firm
— 3 — —

3 10. 1872 Aug 1st capsule, not green leaves

9 " July a whole panicle with young fruit
leaf

4 1871 July leaf & bract

5 " July 20 [illegible] [illegible] [illegible]
nearly ripe capsules [illegible]

2. " June old [illegible] [illegible] fruit is probably No 3

[" July young capsules]

8 1872 Jun flowering

6. 1871 Aug. dried stalk,

1. " June 15 flowering, bract leaf.
Hunting island plant

3. " Beech island leaf & bract

7 1872 whole plant, leaves taken off

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Lieber Julius

Herr L. Braun hatte die Gefälligkeit, dir das Daguerreotyp unseres Georg für Mutter zu überbringen. Es ist grade an seinem dritten Geburtstage genommen und wie du selbst beurtheilen kannst, sehr glücklich gerathen. Ich hoffe es soll namentlich Mutter viele Freude machen, da sie das Original aber doch vielleicht noch lange nicht zu sehen bekommen wird.

Herr Braun, Kaufmann hier, ein Freund von mir und Reisegenosse, wird dir wohl selbst dies bringen. Du wirst an

1. Yucca filamentosa ! James Island [illegible]
2. " " ! self cult. 1871
3. " " !! Shaw's Garden 1871
4. " " ?! Bartram's Garden 1869
5. " " ?! Agric. Garden Washington 1871
6. " " ?! Saltwater, Hunting Island 1870 Jan
7. " " ?! Sandy fields [illegible] Febr 1871
8. [illegible] ?? Seabrook's New River 1870
9. " " ??! No 2 Bluffton 1871
10. [illegible] ?? No 3 Bluffton 1871
13. " " ? [illegible] Cult. 1869
14. " " ? St Louis, cult. [illegible] 1870

11. Yucca Whipplei 1871 S. Luis Obispo
16. " " San Gabriel River
17. " " Bigelow Williams River

12. Y. rupicola Lindheimer 1871
15. " " Los Ceros [illegible]

18. Y. angustifolia Big Bend Missouri 1852
19. Y. " Camp Lincoln Arizona 1866
20. Y. " polyxema El Paso Wisl. 1846
21. Y. " radiosa Arizona Palmer 1869

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Rec^d July 30^th
Ans Aug 4^th

Bluffton,
26 July 72

To
Dr Engelmann,
My dear Dr,

I trust you have ere this rec^d packages of Capsules both of No 2 (Paucifolia) & also of No 3 — the last with almost the whole panicle. A few hours ago in crossing the marshes to see a patient I found several of Y. Draconis just in fruit — on a little islet — surnamed of "Corn"! Stopped my boat there to try & satisfy myself whether the young Capsules of Y.D. erect themselves later

the dry filamentous
ones & afterwards became
pendent from weight &
bulk — or were always
& from the first pendent.
Now it is true I did not see
these things in the first formative
stage after impregnation, but from
the appearance of both dried flowers
& the very young fruit & also the
older fruit I am satisfied they
never erect themselves. The fact is
the flowers are long & heavy & the
pedicels also very long. So the
young fruit remains hanging
downward precisely as the flower.
Certainly such was the case
in the 3 or 4 observed this
morning. A week or two ago
on Hilton Head as I wrote
you I found several just in
flower, but I could then learn
nothing from them. I send
package by this mail of capsules
&c of Y. D. from "Coosh Isld"
so that you can see for yourself.
It has been a terribly
hot day & hardly yet have I
recovered from the sweltering on the
water so much today.

P.S. I enclose fruiting & very
flowers of Y. D. collected
on Hilton Hd. a
week or two since
J. H. Mell

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I say again "Nor a Dev"! — not that I am "ungenerous" but you are liberal with valuable time, & I would have spared you! Yo —

Bluffton, S.C
2. Aug/72

Dr Engelmann.

Rec Aug 9th

My Dr E.

It wanted but an half hour o' Sundown when a man with a long legged mule & a "ram-shackled" buggy summoned me to go 13 miles in the country. I propose to take the P.O. in our way, & to my surprise & great delight the Yankee P.M. shuffles out a letter with yr now to me most familiar hand! A truce say I [illegible] to mean cares & the vexations tyrannies of the time! — The evening gales blow sweet through the cool Pine-lands, & while my friend the Countryman beats & belabours his mule, — I shall read my letter! And a pleasant time it gave me & you have my heartiest thanks! I was somewhat prepared for your conclusions (?) as to the impregnation of Yucca from what you had formerly written, & yet somehow I do not yet feel entirely satisfied as to this matter of fecundation by the said moths, — wh. doubtless springs from my ignorance of Entomology. (See how the sciences

Should like to know if Nos 2 & 3. capsules came, & fruit of Y. a now touch each other at so many points!) Is it possible that such an insect could bore from outside the tender capsule & deposit its egg within, which in turn becomes the dirty red worm (several of wh. I have examined) without its pushing the pollen &c down the stigmatic tube? I only ask for information & suggestion, so as to be sure about it. From the fact that on the young capsules I have not seen any mark of Punctures & that the egg seems to hatch almost within the seeds & the worm steadily eating his way right through & then boring ~~through~~ out into the outer world — I am inclined to think with you that this little moth does the business, ~~found~~ provided, we find that in going through his changes ~~he gets back once more~~ the larva gets back once more into the same moth! This we have not yet seen, though possibly any skillful Entomologist may say with accuracy. I did not place any sand in my tumbler wh. contained the capsules full of larvae — because I thought it likely they behaved like our cotton Caterpillars wh. make 3 or 4 broods during their work of havoc — that is, — the fly first lays the egg & the egg becomes the worm, & the worm instead of falling to the earth winds himself up in the cotton leaves & after a short chrysalis state bursts again into the fly & so on, — the third brood generally doing the business of

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eating up a field, wh I've seen happen in a vy few days. May not therefore there be more than one brood of your yucca moth during the summer? & why should they not "wind up" like our cotton Catepillars instead of falling to the earth? ~~Now some~~ And yet what would they live on !? Now a few of my dirty red yucca worms did creep out & eventually disappeared in slime at the bottom of the tumbler, but still I find certain small chrysalids encased in their webs among the capsules & peduncles &c, wh possibly may be the same & wh may yet "transmogrify" into our little friends the white moths! — We will see! —

Furthermore — if these white moths be "the sinners" engaged in this impregnation they do not seem always to perform their task. Last summer you may possibly remember my referring to a vy tall & beautiful specimen of No 2. (Y. Paucifolia !) in bloom, the flowers of wh were filled with these same moths, (I remember once examining the same after a shower in the afternoon) — and not a single ~~cat~~ flower was impregnated, & not a capsule formed — to my great disappointment. This was the same plant with vy long leaves wh I sent you marked II.

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But of course because they fail in their work on certain plants is no proof that that they do not do it on some! — still I mention it! — Again, my patch of Yucca No 1 at "Nanny Creek field" is very fertile this year, there being many capsules on each stalk, & yet I do not remember to have seen a single white moth hidden in the flowers, tho' there were hundreds of the bugs wh I last sent you, & ~~a good many~~ some of the smaller wh you first recd from me, & also a few of another kind somewhat re-sembling "fire-flies" — or "lightning bugs" — as "we boys" used to call them in the old days! Nor is this any proof of the non-agency of the little white moth, — but I mention it! They may have sought the shades of the cool woods wh were near & return in the night time to the Yucca plants! The moths wh I sent you I found in the flowers of No 3 in "Sageretia field", & these plants are wonderfully prolific in capsules, & I may say in passing, that all of my experiments for the fecundation of these flowers failed — indeed when I got there, fruit was forming largely, & the flowers left were perhaps inferior & unfit for the work ———.

It seems I had somewhat anticipated your wants, for, when I recd yr letter

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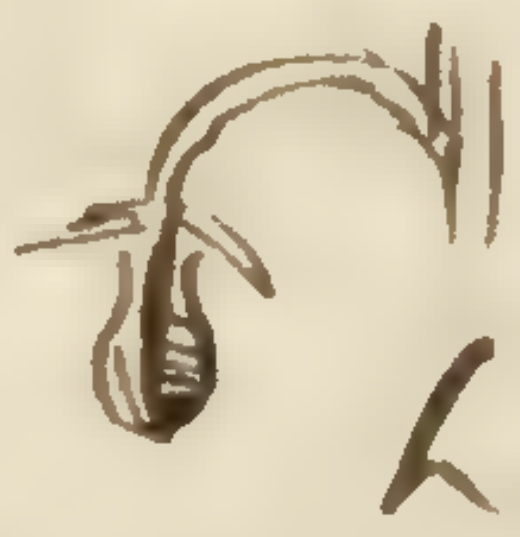
Rec^d Aug 9 72 ②

I had already sent you a note with accompanying package of fruit of Y. Draconis – or Aloëfolia I shld say – just collected on Corn Isld. I have since Examined others & am still of the opinion that the flower after impregnation ~~stills~~ remains pendulous – never erecting itself with the young fruit, tho' as I before remarked altho' I saw many flowers wh ~~had f~~ were just blooming, it was too early to be assured of their fertility, at anyrate all were pendulous. The young fruits wh I sent you were also, all of them hanging downwards  like the flowers, tho' certainly if ~~they~~ these had ever been ~~correct~~ erect, their weight would not at this early period have pulled them down – as you must yrself allow. It is possible nevertheless that these small capsules were mal-formed & abortive, – but no matter, the flowers had been fertilised, & if it be their nature to ~~have~~ erect themselves after the manner of the dry capsular ones, these should have been erect, for as above stated their weight wld not have dragged them down. I conclude therefore that the fruit is always pendulous. Had these things been always under my eye in my own yard – I might have spoken more Ex-cathedraish, as it is I give you the best I can get, – but to me it is Conclusive! ——
– possibly not yet so to you! ——

I do not see that there is any especial difference in the construction of the Y. Aloifolia flr. — from the filamentose Yuccas, & if the moth could assist in the one case he cd as easily assist in the other, & in both cases after all what the ~~moth~~ larva would subsist on would be seed & not Pulp! Unfortunately I have no Yucca Aloifol. plants in bloom near me, — only on the little islds. difficult to reach except when passing on my prof. work — have they bloomed & fruited; so I cannot tell you whether the filamentose white moth or any other is to be found in their flrs. This is unfortunate! But I can tell you what I have seen thus far; if one carefully Examines the surface of the pulpy "Bananas" (Y. Al.) (and they are now many of them of full size — tho' green,) minute punctures or depressions are to be seen, these Evidently ~~from~~ performed by some insect from without — inward. An egg is laid just outside of the seeds & surrounded by the pulpy portion, which egg becomes a worm, & which when mature eno' turns instinctively for the seed & commences to eat away. I have now before me a portion of the fruit with a seed partially gnawed. I traced the worm from his nest *outside of the seed to the seed* - which I found partially eaten, & there I discovered him snugly ensconced! And this in one or two other instances. In other examinations the worm was still quiet outside of the seed in the pulp, - not having yet commenced to bore. This worm is much smaller than the filamentose one & *white*, not reddish. Possibly he is young & may grow, but if big enough to eat is he not full grown? *Possibly* he will turn out to be the reddish white *one* wh you think sprang from the moth? Who knows, time will decide! So far it seems he comes from *without* - inward; whereas the other comes from *within* (stigmatic tube) outward, - tho' both eventually make their way out at some time or other - no matter what their mode of ingress! But I see no reason why the same moth may not perform the same offices for both the pulpy & dry capsular yuccas. It is seed they want; & seed they can get in the former also, - only the larvae will have to cut their way through a little heavier crust

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of rind or pulp! It remains therefore to be seen whether the reddish larva found in capsule of filamentosa is pierced from the ovipositor being thrust down the stigmatic tube (as you say) or, — from the tender capsule being *pierced Externally* — as seems to me to be the case in the Pulpy Yuccas. If the latter then the moth (Tortrix!) may not be the agt in impregnation, but some other! But what is the use of talk when one must wait & see what indeed Nature says! See now my Dr Sr what a brave Gascon I am! — ignorant, — densely so of Entomology & yet running on after this fashion — wh may make yrself or some *other* Explode with laughter at my mistakes! But no matter! I shall continue to Examine fruit & report — shall send more to you also. I must mention that last fall having collected a good many fine *Pulpy* fruits of Y.a. I placed them in my Office, — they gradually softened & generated a vast no. of very small flies of a dirty whitish brown colour & larger than the "merry wings" or "sand flies". Upon un-covering the paper top of my tumbler with the capsules of Filamentosa, I saw several of the same, — but this doubtless occurs in any decaying fruit — & has *nothing to do* with the matter in hand.

There are no intermediate forms (I never saw them!) between No 1 & No 4! It is Either No 1, or No 4. — neither more nor less! and I can't look upon them as the same, tho' both of them incline to make a '*little trunk*' — *wh* so far as I know Nos 2 & 3 never do. The No 4 from the middle Country (Ft. Motte) (& I Examined

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Recd Aug 9 72

(3)

large patches of them) - is always the same both up there - & down here: I mentioned to you that I had found a good patch of them growing but a few feet from No 2 (Y. Paucifolia) precisely like those up the Country, & I sent you specimens of the same. Did you get them? - marked I believe "Buck Island". Capsules certainly alike & flowers also, judging from those my Father sent me. I did find differences in the subterranean caudex, but not I think "very reliable; - I can however again latter to the Hoe, wh, like your "sarcastic friend" I am a believer in, as that I can use with more ease to myself than the Microscope. I think you mistook me. Did I ~~[illegible]~~ say I preferred Longifolia to Paucifolia? - I thought I said Longifolia was doubtless good, - but Paucifolia perhaps was preferable, not that the plant could be said to have few leaves - having 25 to 50, but it was Paucifolia by comparison with others. And yet I have seen No 4. down here with very few leaves.

Flaccida is perhaps after all the most appropriate. Once again as to the fertilization of the Yucca flower. In the dry capsular forms the flowers when fertilized wither & become erect, - the others drop, - now in the Pulpy forms very many flowers remain on the Panicle - pendulous & dried, - among the fruit -, tho' not themselves fertilized. They seem to cling with more tenacity than the others!

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The Opuntia fl^r sent was the same you rec^d before wh you think O. Vulgaris; but to me it looks more like that western plant (O. macrorhiza). It is not prostrate, erect. Longimamma wd be most appropriate for the other. Am delighted that I shd have discov^d a new Acerates, — will send fruit if it bears, — none last year:

Sent yesterday another spec^n of P. Elliottii just plucked ^ most atrociously fixed up for mail, as you said you had not yet had one showing the well matured cones on the branch. Shall send another of P. Australis wh I cld not get for you last year, — I have one cone about 10 inches I think also another showing the cones of this Spring & last — wh condition I take to be Exceedingly (rare). Unlike the other Pines I suspect P. australis only sheds mast every other year. Last year none, — this year millions of cones maturing this fall, but so far as I can see (& I have examined for miles as I went along) the cones of this Spring ('72) are extremely few — almost ~~[illegible]~~ none! And yet they do occur, ^ on the same branch also, as my specimen sent to you will prove from a tree cut in the Spring on wh there were a good many such. But from what I can see on the road it is an Extremely rare event. But not so with Tæda, Serotina, Glabra and Mitis — they cast seed every year.

Will send bulbs of Lilium Catesbaei ^ dried fls of same if you care to have them, — also Lachnanthes Tinct (found yesterday) Zigadenus Glab. ^ "Tofieldia Pubens" if not found with you. First leisure I have had for a long time, & a mixture of Malaria, Quinine & Coup de Soleil ~~fun~~ must acct for my fogginess as to leaves of No 2 wh I'll explain another time. my letter

I have somewhat to say as to Y. gloriosa wh I reserve for another time.

Rec Aug 13
Ans — 14

Bluffton S.C.
7. Aug 72

To Dr Engelmann

My Dr Sir,

Your last of 29 July has just come to hand, — that of 20 July answered a day or two since — at the same time sending a package wh. as the mail man had to do some swimming is very likely to dis-appear wet & dripping in that vast Limbo of the mail. I will hope for the best as it contained specimens wh. I wish you to get. You have received capsules of No 2 from Hilton Head (an isld with a sea-beach 10 miles from me) & I may say I have never seen any other Y. f. there, — but you say nothing of the panicle of green capsules of No 3. sent some time after, nor of the pulpy fruit of various sizes with pendulous flowers & small pendulous fruit of Y. aloifolia from "Corn Isld". A letter accompanied the same thro' the mail, describing this last. I regard the pendulous matter as settled. And now while I have leisure today let me try & reply to your queries at once — seriatim.

In my letter sent yesterday I expressed myself as not yet being fully satisfied as to the agency of "Pronuba" in impregnating the yucca. What I had to say I'm pretty sure sprang from Entomological blindness, & was very floundering & "flabbergasted" (to use a new coined — & ridiculous but expressive word!) still, you can see what I was driving at, & as I believe you to be full of philosophical good temper & equanimity when dealing with "feeble folk" — I trusted you wd pardon me. I have now furthermore to say — that if every flower wh is fertilised is fertilised by the moth stuffing in the pollen & at the same time depositing its egg; — then, why is it that every capsule is not bored by ~~the~~ a larva making its exit? A great many are bored, — perhaps two thirds or more, — but some are not — as my mature capsules of No 1 will prove to you, if you ever get them! [Although you will find hundreds of ~~gr~~ black seeds among them you may not find a single perfect one, I found but 2 or 3!] Now if all flowers are fertilised in the same way, ought not all capsules to be bored? — unless indeed the egg be in some way or other destroyed, — or even the larva before he had had his fill of yucca seeds! What say you? Possibly the worm may die in the cerements of his

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capsular tomb — because All of his seed wh he expected to eat — (or rather what his mother the moth expected him to eat) — were — false! — no meat in them! & so he dies right there, after the fashion of Dean Swift's "poisoned rat in a ~~w~~hole"! —

You see I think the whole thing so beautiful of the instinctive action of the insects, & your discovery so remarkable — that I wish it to be so, & therefore give you the benefit of all suppositions! — only, so, I wish to be sure about it, & repeat ~~what~~ over again yr own quotation somewhat changed — "Amicus Engel. — sed mag. amic. Ver!" [nomine mutato de te fab. narrat. — I believe I saw something like that in a school book 2 or 3 aeons ago! —]

But perhaps you saw this moth at work — ! that settles the question! How I regret that I have not these plants near me both of Yf & Y. aloifol so that I could have watched them at all times & seasons! The former are in deserted fields not easy to visit at night & the latter mostly on the little isls away off in the marsh! Better try & save the larvae of No 2 wh reached you alive & see for yrself — if he runs back into the moth.

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I doubt not that the seed of Nos 1. 2 & 3 & perhaps 4 one of our Examiner will distinguish them all. 1 & 4 have certainly the same flowering time, same capsule & same (?) seed, but it seems very curious that no other (so far as I know) is seen in the middle country & holds precisely the same characteristics of leaf. both at Ft. Motte & James Isld & here also at two places. I see no transition forms & the leaves of the two plants are so difft. that in my mind I cannot unite them, unless you tell me to do so! No 1 is the smallest of all in capsular form about me & more or less constricted — with secondary dissepiments wanting. This is certainly well marked — in one or two instances of the Hilton Head No 2, the sec. dissep. was either wanting also or incomplete but as a general rule no doubt (according to my present knowledge) it is present in 2 & 3, & wanting in 1.

"The flowers make me approximate 1 & 3"! — I am astonished! If you had said the fls of 2 & 3 approximated — I wd have said "all right," & even if you had insisted on classing them (2 & 3) together as you do 1 & 4 I might give a very sullen & grumbling assent (tho' I'd still whisper to myself in the style of one Gallileo!) but I see

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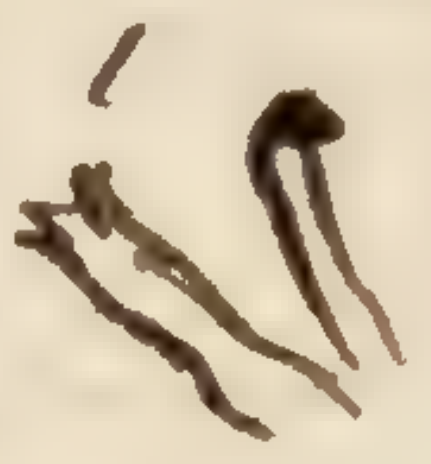
Rec'd Aug 13, 1872

2) no resemblance in their flowers. No 3 is ~~[illegible]~~ usually larger – thicker, heavier & coarser :∧ extremely like No 2 save in that old difference of the filaments stig ∧ c

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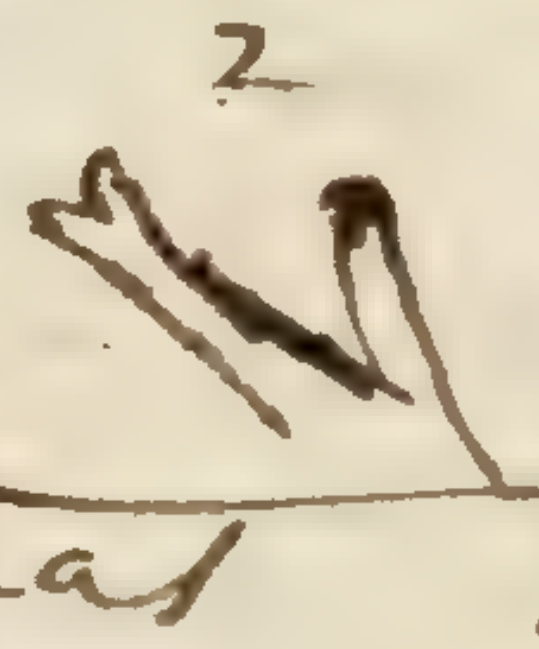
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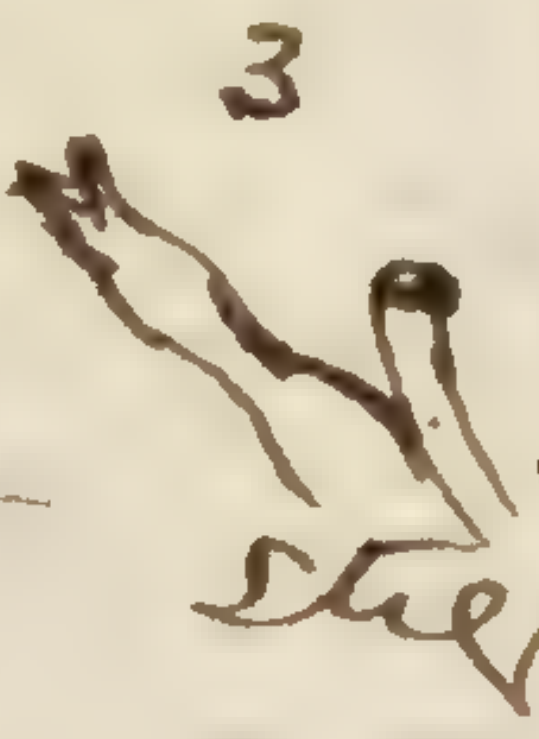
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. I observed this season also that the stigmatic tube was white in No 3 – becoming greenish as you approach the seed vessels ∧ now I observe in the capsules a considerable beak; in shape otherwise ∧ very much resembling Hillow Ho. No 2. No constriction. yet last year in "Cemetery field" they were longish & constricted also – were they not? But these capsules of last year seemed to be imperfect – tho' some I sent you I allowed to remain on the stalk until they assumed a blackish tinge. Perhaps such characters are unreliable – who knows? – "Irishman's flea" again! I will say this that altho' I believe No 2 & 3 to be entirely distinct, they are much nearer together than 1 ∧ 3 & even 1 & 4. But this last I've never seen in bloom. Dare say I can get plenty of seed of 3 this year ∧ from a new field. "Crop ribs & reticulation" – not much in that I fancy ∧ the same of "prominent middle rib on each carpel".. As for the "carinæ" don't know anything about it from what I see here.

I do not feel sure that there is any special character in the dehiscence ∧ bursting of the capsules. They seem to me to act all

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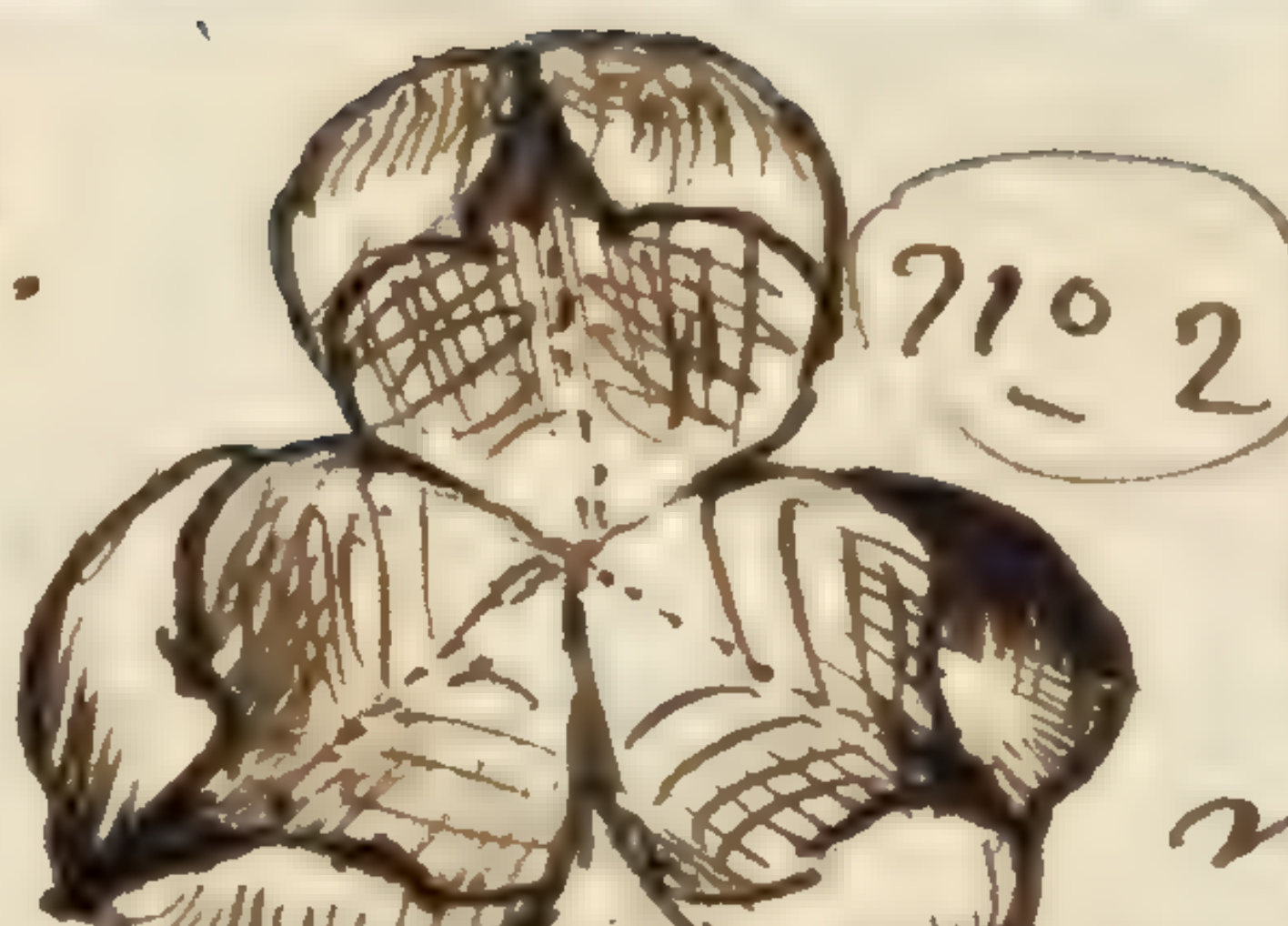
in the same way.



that is after the capsule commences to mature or has matured & shed off — the fruit is still closed but commences to "crack" on the upper & outer portion — at the point of the false dissepiments. This "cracking" ex-tends a short distance, less than 1/3d the length of the capsule — eventually the divisions or valves tear aloose from each other & exposing down to the base & the seeds & dissepiments. At present No 1 is just cracking as you will see by those sent. I do lay stress on the length of the Panicle as I describe to you only what I see in my own little nook, & can't help it ~~tat~~ how other things behave either in Mo. or Texas!. To me it is an important feature & indicates a vast difference between No 1 & 2 & 3. Possibly if I got among those various Yuccas I might see all sorts of distinctions & might mystify myself (& you too?) still more! Better stay here & work these out first — if that be possible! — I would advise you to save seeds of Hilton Hd No 2 at once — (I dare say they are mature enu' for the microscope) because a darkey here took

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a fancy to my only two at "Lagerstia field" — so no fruit sight about me. A Yankee however on H. Hd. promised to look after those I left & save them for me when mature. I am more disposed to rely upon the examination of seeds in that way — for other things are so terribly elusive! The leaves I send are in-variably cut as near the trunk as I can reach with my knife, & you can form a perfectly accurate idea of all these 3 species by examining the 3 plants sent & then comparing them with the fresh green ones I send from time to time. You wonder at the mutilation of No. 2. It was first bound up green, & in that state was rather melted & decayed in a close room — after-wards the leaves were shaken out & bound up again for mail.

This specn. had the longest leaves I have yet met, tho' I have seen others frequently approaching it.

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In a cotton field where the leaves are cut from year to year they seem to be shortened after growing out but if you get hold of a plant wh has not bloomed & wh possibly may escape mutilation in such a situation the leaves another year will show the usual length. That is what I meant by "giving them time". It is undoubtedly a long leaved plant & hence flaccid. generally has less threads than the rest, old leaves frequently none. You can be guided entirely as I said by the 3 stocks wh are fair specimens — no variations of any acct. The threads are coarser in No 4 than all the others & quite abundant; — equally so in No 1, but finer & more disposed I think to twists & curl. In No 3 abundant also but perhaps a little less so than in No 1. & may be also — coarser. Somewhat variable all of these things are I conclude with diff^t plants in diff^t situations. Will procure good plants as you desire in Nov^r & cones also. Forgot to say that last week I sent you P. Ell. with cones of this spring (received of course) & also of last wh are now almost of full size. In package of yesterday P. austral. 2. spec^{ns} with cones of last & this year plucked in spring & another just taken from tree. Well, I've written "muckle" but don't think you've got much. Yrs truly G. H. M

Rec^d Aug 16, 1872
Ans — 19 —

Bluffton S C
Aug 12

To Dr Engelmann.

My Dr Dr

Your letters of 20 & 29 July have both been answered — & package sent by last mail, — and yesterday came your last of 4 Aug. You will see from what I've written that I do not feel as certain as I could wish to be as to the agency of the moth in the impregnation of Yucca, — but it all amounts to this!

1st. Is it certain & beyond doubt that the reddish worm found in the half ripe capsules of Y. filamentosa comes from the egg deposited by the white moth? & has any competent person seen the said worm go through its successive changes back again into the moth? ———

2d. Supposing that it's certain as to the origin of the worm from the moth, is it beyond doubt that the egg was deposited thro' the stigmatic tube & not by the piercing of the capsule when very tender & green? ———

3d. Is it possible that such a moth so constructed could perforate the tender capsule from without & deposit its egg? ———

4th. Is it not a fact that the white moths are sometimes found abundantly in flowers wh. are not impregnated, & wh. therefore fail to become fruit? (see letter)

5th. Is it not a fact that some plants bear fruit most abundantly, in the flowers of wh. no moths have been seen? (see letter!) ———

6th If every flower which is fecundated be so thro' the agency of the moth's depositing eggs, — ought not every capsule to be perforated by the larva's exit? ——— (letter)

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in a half formed condition, or, if perfectly formed — too weak to commence his work, — or — already at work gnawing away at the seeds! I said moreover that this worm was white, — not reddish, & much smaller than that of Y. filamentosa, — still being immature it was impossible to say what he may or may not turn out to be! But from the fact that I could not trace him first from the seed, but from the pulp to the seed I thought it likely that the white & reddish worms were different! I now think it extremely likely that they are one & the same! The examination of ~~[illegible]~~ other fruits disclosed the fact that eggs or half formed worms were to be found not in the pulp, but right in the track of the seeds, but whether the egg got there through the stigmatic tube, or through the rind of the very young & tender capsule — was now the question! for I was not able to trace the course from the seeds outwards! I gave you a drawing of these eggs & worms — thus, . Being over on Hilton Hd Isd yesterday I brought back with me several "Bananas" more mature than those at "Corn G'ld" & other places. One or two becoming slightly purplish, but all of them

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Smallish — but with good seed, somewhat constricted in the middle, with the ends twisted up . I first examine for any marks of depressions & punctures wh it is easy eno' to find, — I cut off slice by slice as thin as I can until I approach the seed, — all the while following the track of the puncture as indicated by a greenish or brownish mark in the white pulp, & I come at last not to the original bed or nest in the pulp (from wh in the former instances the worm had crawled to the seed) — (in this case) for there is no bed or excavation at all in the pulp — simply the greenish streak leading to the seeds; — the lines of seeds are now presented, — they seem perfect & yet they have a suspiciously thin look & treacherously hollow, — still their outer husk is unbroken, look closely! & a faint motion within may be discerned, — break in the walls now & "what is that I see before me"? — a reddish coloured worm hard at work & tunnelling away thro' the seed! — perhaps he is half way thro' a line already! this worm at present seems not quite so fat & maggot like as the other (4.f) but he is of about the same size & walks like him & of precisely the same colour — reddish-white.

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Rec.d Aug 16 1872

from the egg thro' the Stigma! but then how to account (i.e. the egg) for my having traced the worm from the depression on the surface of the fruit, thro' the Pulp, — to the seed, — within the seed, — where Monsieur was hard at work eating? Is not this worth looking + after, if indeed I've seen things aright? —

As for the fact of Y. a. producing fruit in Europe & not Y. f. — it seems very curious & rather bolsters my theory above. — But if you are right then I suppose it is — "faute de l'insecte"!

Please pardon my presumption in offering any objections; — perhaps I ought not to venture in such a path with my want of Entomological & botanical knowledge — only taking up yr time; — but I am really interested & thought I might assist even yrself with my vagaries! —

You say that as "Y. gloriosa" blooms so late in the year (Sep & Oc) the time is not fitted for the action of these insects, — hence ~~they~~ it ~~are~~ is so sterile! True, I've yet found no fruit, but sterile they certainly cannot be in all instances, for how then is the plant propagated all along our coast — in the drifting sands of the Sea-beach, — in old fields, & even in the woods under pine-saplings?

not certainly from stems & shoots — this in most cases is impossible. It is but a short time since I examined one in the woods near the river — wh was but a few years old, & wh without doubt came from seed. Seed of course dropped by birds, — think you from some more southerly clime where ~~they~~ Y.s may be fertilised by insects? Hardly, — Perhaps indeed the plant sometimes blooms in June & July & then fruit makes! But I believe it blooms only in the Fall!

To comfort you now I will say that I have at last met transition leaves (one plant) of No 1 — running No 4-wards — growing under trees in the shade! will let you see them; — still I say the leaves ought to separate them. Nothing alike in leaf & growth — but if they be the same {1. angust} {2. latifol} is the exact thing. (No 2.) Paucifolia, by comparison with 1 & 3, but 1 & 3 may be paucifolia, tho' rarely or never — so strike it out! Longifolia! but I have seen No 2 short leaved in one or two instances & once No 3 long leaved — so strike that out, therefore Laxifolia let it be or flaccida. Laxifolia fulfills all conditions, for the leaves from their length & flaccidity give it a loose appearance — never crowded. Decidedly the best! Y. Bracteata correct. Is it not a suspicious thing that it is so terribly hard to give these forms names & yet they are vy distinct. The seeds I trust will prove it always — I do not fear it. It is going to be a hard business, getting seed for you of 1, 2, 3 — Everything eaten up!

Yrs truly

With my present lights I believe this worm to be the same as the one found in the capsules of Y. filamentosa! & how did he get in there? — Through the tender capsule in egg shape, — or through the stigmatic tube? But I trace the course of the puncture from the outer rind, thro' the pulp & to the seeds — within wh I find him pushing like a mole. What do I infer then but that when the capsule was young — just swelling after the impregnation of the flower — the fly or moth (be it what it may, — Pronuba or some other!) pierced ~~Pierced~~ the thin & soft juicy seedvessel & laid it's egg, — sometimes outside the seeds, & frequently — perhaps almost always — within the seeds, where I discovered it half egg — half worm in one or two instances; or, as now in mature worm shape, fulfilling it's role of eating forward & backward, & then when it's time comes — eating out into the outer world!

What do I infer then again? Why of course, — (don't you see what I'm driving at!) that if the pulpy yucca worm gets in not by the stigmatic tube, but thro' the puncturing of the walls of the capsule, — the same may happen to the dry capsular worm & that therefore the impregnation occurs thro' other sources.

(depression, &
course of puncture, under
leading to seed,
wh the worm is at work)

Wishing to ~~Had~~ Examine these worms side by side I broke into an almost dried capsule of Y. 6 No 1, when I was fortunate eno' to find two reddish worms wh had evidently no idea of cutting their way out — for they were very snug in their home — having apparently fenced themselves in by a vy slight & thin cobwebby covering, under wh they were enjoying an anticipatory chrysalid repose! I no sooner however broke in upon them ~~but~~ than they became terribly active & insisted on getting out, & that, "immediately if not sooner"! Nothing could keep them in, so I permitted them a walk in the open air to cool their Excitement & stretch their cramped up limbs — ! I next kindly invited them to return to their home — but like maniacs they steadfastly refused, so placed them in my tumbler one third filled with ~~[illegible]~~ sand — to see how they'd behave there! Nothing but walk — walk, in a continued circle around the walls of their prison House! The earth in my tumbler was packed & hard, — I bethought me of loosening it, wh I did, & immediately they disappeared in the soft sand like moles, — nor have I seen them since! Now these worms I compared side by side with those of Y. Aloifolia, & Except that the former were fatter as I said & more mature, they seemed to me to be the same & such do I believe them to be with my present lights! Possibly an Entomologist wld discover differences immediately, but then I'm no Entomologist! I trust you will be able to see them for yself & judge whether they be indeed the same. Now granting them to be the same it is of course possible that they both came

7th Is it not a fact that altho' very many capsules *are* bored, by the worm's making its escape from the Capsule, — yet, a good many also are not bored at all? ——

8th If it be proven that it is possible for the egg to be deposited not thro' the stigmatic tube, *but by the piercing of the capsule when tender & green*, does it not throw doubt upon the agency of this especial moth's assisting in the fertilization of the flower by thrusting the pollen into the stigma? ——

9th, And if so may there not be some other agent? ——

I believe that is about all I had to say; — Am I only a "doubting Thomas", — or a "puzzle-headed fellow", — or a mere starter of feeble & foolish objections just for the sake of objecting?

Now let us return to the Pulpy fruit of Y. aloifolia — good specimens of wh. I sent last mail. & I doubt not

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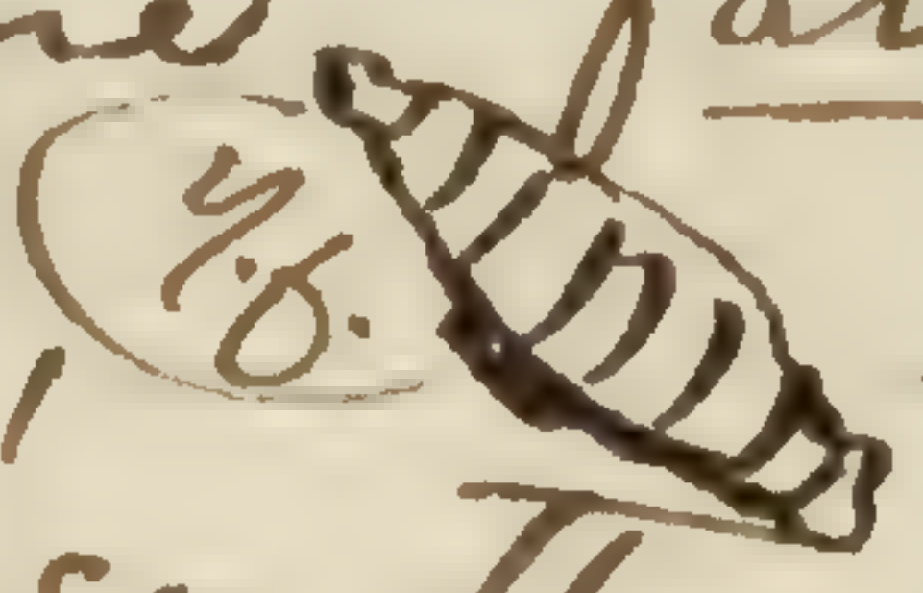
6b

full of worms! I first stated that a small white worm (immature of course) was to be found in the pulp just outside of the seeds, — his present condition dormant for the most part, but that in one or two instances he had roused him from his lethargy & pierced through the pulp into the seeds — where I found him commencing to gnaw! The inference therefore that ~~he~~ he was a seed eater & not a Pulp-eater; & so far at least related to his friend — or Brother (?) the larva of Y. filamentosa! Now this worm also I stated could be easily traced from the place in the pulp where the egg was deposited, and how? Simply by examining the surface of the "banana" small depressions or holes c'd be detected — tho' now pretty well healed over. Cut off a thin slice just over the depression & you will see the marks of an old puncture: tho' the white pulp & if you continue cutting away slice by slice, you at last come to the egg nest, where the worm is either still

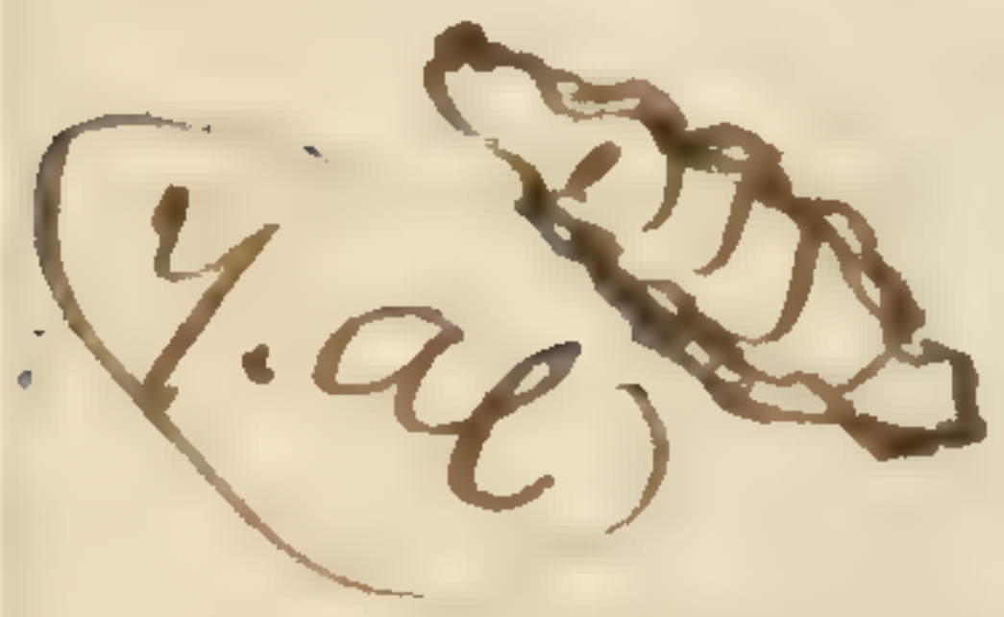
Recd. Aug 16
7

10. Aug. '72

P.S— I have just made another comparative examination of the two worms of Y. f. & Y. Al. & now enclose two of each fixed up in a little phial of alcohol;— They are ~~sep~~ separated by cotton! The 2 below are from pulpy cap of Y. Aloifolia — the 2 above are from Y. f. No 3 (Bracteata)

[illegible] are about the same length, but those of Y. f. are fatter & more maggot like in shape, 

— reddish, with a greenish tinge over the abdomen. Those of Y. Al are slimmer, reddish, but not of so pronounced a colour as Y. f.;— also greenish over abdomen. The rings of Y. al. worm are more deeply marked — (not lived long eno' yet & eaten eno' to "fill up" like Y. f.?!).



Counting the head & the knob of the tail as rings, I make 14 in both kinds — also 6 true feet

I send the phial in another letter by this mail.

aug 10, 72 7a

in each — if there be others they are rudimentary. In both a few scattered hairs about the body. mouth & head seemingly the same — darker brown in Y. f.

Please Examine & submit to Mr Riley to determine, — you will however re-member that my Y. Al. worms are not as ancient as those of Y. f tho' both eating hugely — or rather those of Y. f have done eating & are now enjoying repose — Hybernating one may say & possibly getting fat like a "Bar"! Possibly my Y. Al when they have finished eating & are ready to hybernate also, will have assumed the more deeply ruddy tinge of Y. f as well as his more decided aldermanic proportions! What say you? the same, or only nearly allied? I placed another worm of Y. f. in my tumbler of earth, & after walking a little, down he burrowed like the others!

E. H.

aug 10, 72 71a

[illegible] 1872

P.S. In my last letter I referred to a worm — (white, & smaller than the reddish col^d. larvæ —) which I found in the pulpy portion of fruit of Y. Aloifol, & which in a few instances was lying perdu outside of the seeds, & in others had made his way already to the seeds wh he had just commenced to eat. I said this worm could be ~~[illegible]~~ traced from within the pulpy portion, (where the Egg was laid to the seed wh he was expected to eat & that it was not likely that in his original ~~[illegible]~~ Egg state he got into the fruit through the stigmatic tube! but from ~~the~~ ~~[illegible]~~ outside the capsule in its tender green state.

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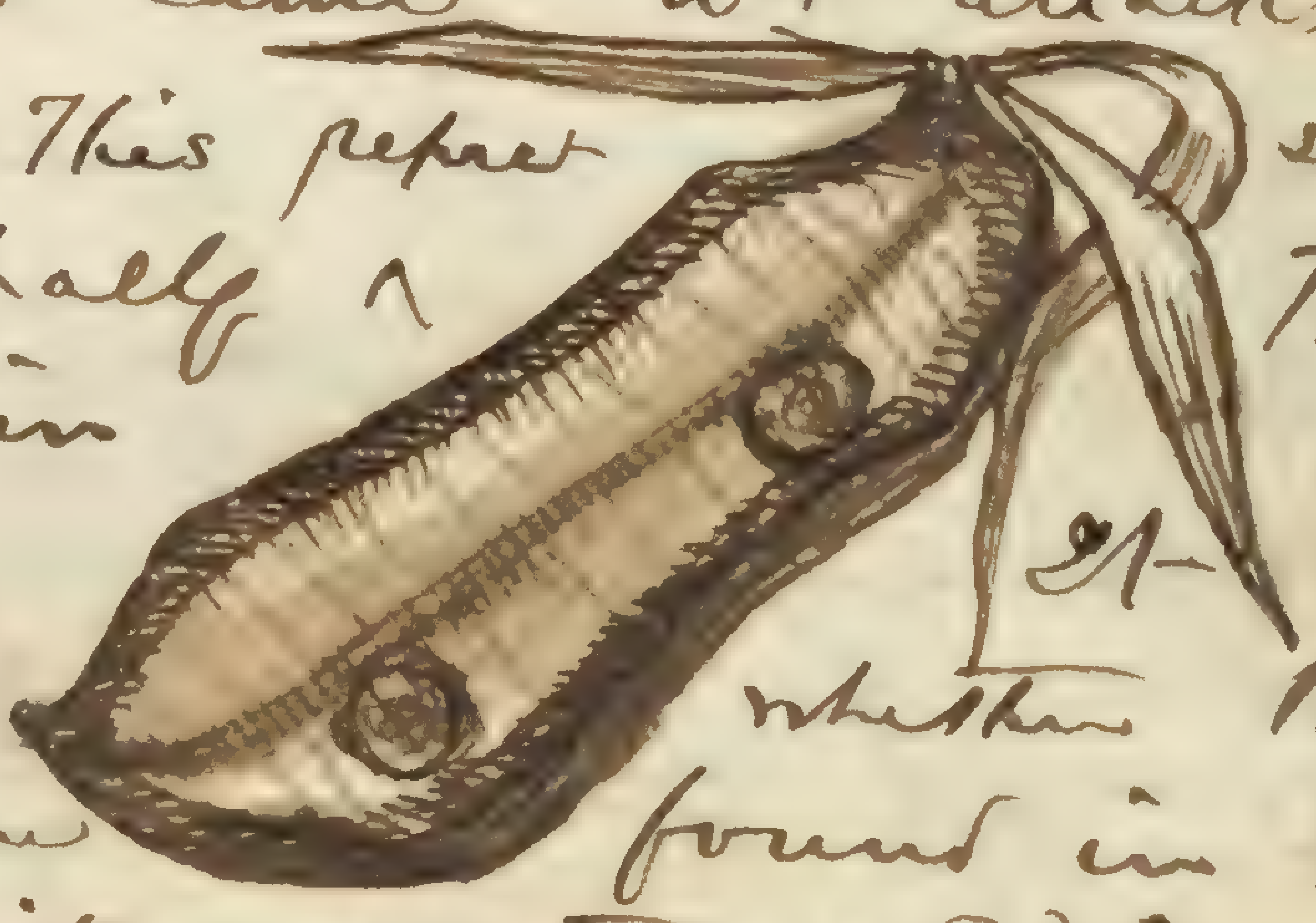
71b

I have however just examined several of the smaller capsules of Y. a. about an inch & half in length & what do I find? In several instances something very like a worm or rather an egg turning into a worm. X very like a young Okra seed & there in the middle of the rows of seed! Take care this is not the same wh attacks the capsules of Y. f.! This represents the cap: sliced in half & the eggs & worms right in the track of the seeds. It remains to be seen whether this is the same as the one found in the pulp of the larger fruit, or the reddish col'd Y. f. larva! You doubtless have sev'l of the smaller sent you & indeed various sizes so breed him yrself. I do not think this the same as the Pulp worm — larger!



X It is a growing seed of which only 2 were [illegible]

Enclosed seeds are of No 2. No more.

Rec^d Aug 20
Ans Sept 3

Bluffton S.C.

Dr Engelmann 14. Aug/72

My dear Dr

As you seem desirous of getting still other specimens of Y. leaf — I send by this mail a package containing leaves of No 1 both young & old — the same of No 2 from plants several miles apart — do — do of No 3 (one of these the longest I've seen) also of No 4 a few feet from No 2, & last two little bundles of "transition" leaves marked 5 — the one running from 1 to 4, — the other rougher &c running from 4 " 1! Both growing under trees & quite near together — rather poor & stunted & miserable plants both of them but you may make something of them as answering yr theory. I repeat that 1 & 4 however seem to me very diff^t, but they are the only two that seem disposed to make a real trunk of a few inches: never observed this with 2 & 3. The young leaves of all of them 1.2.3 & 4 are filamentose, but old leaves are disposed to throw off the threads but especially so in 2 — next in 3. No 1 has the finest threads & with greater disposition to curl. No 4 the coarsest. No 2 the scantiest (?) but you will always find a plenty of filaments on ~~all~~ the young leaves of all! The smoothest leaf is in No 1 & No 2. No 2 you can always distinguish if in doubt by the strong

Plants of No 2 distinguished when in the [illegible] by Turkeys: these of No 2 from H. Head.

sharp spine hard to bend or break! not so with No 3 – can't stand the continued pressure of finger even on old leaves. I send also seed, flowers & ripe capsules of No 1 (marked, 1), also a few ripe caps with seeds of No 2 from Hilton Hd. with flowers '72 & caps of last year – ~~all~~ last of these you will get! also seed & caps of No 3 wh are not as mature as I cd have wished – As the worms were eating them up & they were commencing to dry on the stalk – rains also assisting I thought it best to pluck them & save what seed I cd. I send half, balance I reserve in case the package fails to reach you. Same with No 1. but no more of No 2 at all! Also stalk of No 3 showing the clothing of same with a longer leaf up to the panicle. This con-dition is most marked when the plant is about 3–4 feet high & before blooming. now to look at the stalks of 1. 2. & 3 one might see but little difference. but 3 is the only one that continues a good long leaf up to the panicle – the others (1 & 2) have a much shorter leaf as you go up the scape. I refer of course only to good specimens of each plant – there are stunted & inferior ones of 3, wh do not show this condition particularly save when young. Also fruit of Asclep. Paupercula & A. Obtusifol wh I believe grows with you – & ripe seeds of Bletia aphylla*. No 3 as before stated has the softest fibre of all & is ~~eat~~ greedily eaten by all kinds of insects – No 1 the densest of all – No 2 next. I cd pick out a stalk guided by this alone.

* also Rhexia flabella wh one fine-leaved in sandy ponds.

I sent a letter last mail as a kind of résumé of what I had to say as to insects of Y. f. & Y. al, & was in a high gale, really expecting that my next examination of Y. al wld give me plenty of worms now quite red like like Y. f. & still more advanced than those found in pulpy fruit from Hilton Head. 2 of wh I sent you in a phial fixed up in cork! But alas, "raw-haste half sister to delay" will no more do here in looking after Mother Nature than it will any where else! Patience — repeated investigations & an utter disregard of all pre-conceived ideas & theories — these are the qualities to help us along! Yesterday when I came home from Sav. River. tired down I met in my piazza 4 or 5 splendid heads of Y. al literally crammed with fruit — fruit of all sizes & shapes but most of them long & perfectly formed! Soon got at them. I sliced & cut up at least one half with care & patience, but utterly failed to find worms such as I discovd in the H Hd. Y. al & 2 of wh I sent you with 2 also Y. fil! Not one, tho' I sought them like Esau — carefully & with tears. On most of these finer caps of Y. ~~f~~ al. I did not even find a puncture — nor an abrasion & the lines of seed were as regular as the lines of a battalion — Evy seed in its place & intact, not one seed fretted by a worm — the pulp too, white, & perfect & unstained! not the trace of the reddish-greenish bellied larva of Y. f (& also of Y. al of H Hd.!

818 And yet if I in one case found the worm of Y. f in the cap of Y. al surely I had a right to expect him again & there was cause to draw the inference I did. Many of these Y. Al. cap had numbers of worms in them but a little way in the pulp & eating that, of this size & shape . Very small head & white — diffl entirely from the Seedeater sent you. No worms had bored out in these, for nothing had been eaten & the pittings of the rind in some cases wh I observed was done by some insect or bird (?) trying to get at the little white worms in the pulp. So I am at fault, as I had expected to make out a stronger case as to the worm of Y. f & Y al being identical, & if in the one case I cd trace him from a puncture on the rind leading to the seed wh he was eating I might trace him perhaps in the other, & if so the egg was laid by the piercing of the tender seedvessel in each case if not through the stigmatic tube & that possibly the moth may not have impregnated at all but some other. I wish you could have examined microscopically the very young capsules of Y. f & have seen whether the rind was punctured & the egg laid in that way & not the other. How do you acct for the fact that some capsules are perfect & are not bored by any worm getting out? If the moth impregnates with pollen & then ~~to~~ deposits her egg — Every capsule ought to have a worm wh eventually would bore out! I shall continue cutting up Y. Al in hopes still of finding the worm of Y. f. (?) again.

82a

What think you I saw yesterday – growing at an old Pine-land settlement, chiefly the resort of overseers from the rice-fields of Sav. Riv? what else but an Arborescent Cactus some six feet high! – 2 or 3 feet of the trunk or base was white & roughened like that of an old Ilex Cassine – above that covered with spines , & then above the green – branching joints &c.. with fruit on the end. The old lady whom I questioned, said it had been there – planted by her sister – "some 15 or 20 years"! & had never flowered till this summer – pinkish or purplish I understood her to say & very beautiful. I brought a joint home with fruit & planted it.

Somewhat in haste

In open air of course.

Very truly yrs

H. W. R.

Rec° Aug 20 '64

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15 Aug

Yr last of 9 Aug recd — but no package — I will wait for next mail to see capsules — hope to get them then & will reply. I am horrified as to the package of T. Ell — did you pay letter postage? Terrific! I observed that some one had sent you cacti from SWest in ~~the~~ paper you sent me, & his name was on the back — thought it a good plan & helped its coming — will send no more The cones eventually I think will burst. Will see about mistletoes

Have no fruit of No 4 — have requested my Father to do so. Fear it will be a failure. My James Isl'd relative gone off on a trip to old world so he will fail me.

no fruit on "[illegible]"
(seeds are Asimina Parviflora.)

Bluffton SC
19. aug '72

9

Rec Aug 23
Ans Sept 30

To Dr G. Engelmann

My D D,

In my last of 16 aug with package of leaves & seeds I stated that I had just recd yours of 9. aug but as your capsules had not come I wd wait & see what they said!

They have now come, & I have examined them as well as I am able to do — comparing them with my 1. 2 & 3. Your small constrict capsule wh you take to be Y. filamentosa reminded me much of my No 1 & also No 4; — my no 1 however is still smaller & smoother, & the reticulation (?) on the surface much finer, or rather I shd say obscurer than your Y.f. The capsule of No 1 seems to be more papery & delicate than all others wh I've seen. The absence of the secondary dissepiments in 1 & 4, & also in yours (Y.f) is certainly a remarkable coincidence, & if the marking of the seed in all is the same (under the microscope) I may after all be compelled to yield as to 1 & 4, tho' the rough spoon shaped leaves of the one with its coarse filaments — seem so

will look after Phoradendron for you & if any thing new turns up as to Y. al, will write you
JHM

distinct from the smooth narrower leaves with abundant & fine curling thread of the other! As for your "Y. flac" "large straight capsule" I have as yet met with nothing like it, tho' it evidently runs more towards my No. 2 than any other — as indicated by the well marked reticulation, as well as the presence of the sec. dissepts. The Seabrook capsules of No. 2 may approach it more closely — leaves I imagine similar also. As for yr. Y. Puberula it is the most curious of all in the deep sulcus over the false dissep.: making almost 6 perfect lobes instead of 3. And yet after all is not this my No. 3, in wh. the f. dissepiments are always perfect(?)* & wh. also is most markedly pubescent! Did you observe this in the panicle sent you? True, my specimens of Cap of No. 3 of this year are differently shaped, but did not last year's wh. I sent you approach your Y. P.? Is the scape of yr. Y. P. long leaved to the Panicle like my No. 3? Possibly differences in soil may acct. for some of these changes; our lands about here for the most part very sandy & worn out, & will not even grow good S. Isld. unless helped by plenty of marsh-mud & compost, — wh. by the bye they never get now — Cuffee Imperator being as yet unwilling!

* At least that is my Experience so far!

(But what will the seed of your Y. P. say under the microscope? I do not know as yet how much these characters are worth, but I am disposed to place much faith in them, — don't think they will lie!

I much regret that I have only been able to get a few capsules of No 2 from H H. & these when handed to me by my Yankee patient were slippery & mouldy. Best I c'd do — those about here wh. flowered were cut down by negroes. Those I sent you before were reddish & almost or quite mature & plucked by myself; — some good seed in them I doubt not! As for No 3, all are from a patch of plants, some 15 having flowered together but the worms & insects have played "the Old Harry" with them, so much so I thought it best to pluck them before being quite mature. Some of the seed however is I think good! I have sent an abundance of cap. & seed of No 1. many cap. not at all bored, — seed imperfect therefore? (!) Of these last I still have a plenty. You have now eno' of No 1 for all examination, so you must content yrself with what I send of No 2 & 3 & also of last year. If my Father succeeds in getting No 4 from his German friends in the sand hills

9½ I'll send you. I intend to ask him to try ·2/3
& impregnate Y. gloriosa when it blooms on
the lawn near him, — the Experiment will
be worth something — also ask him to look out
for the moth &c. As before stated you
can rely on the ^whole^ plants of 1. 2. & 3 sent as
fairly good spec.^ns^ — representatives — save that
the leaves of that of No. 2 are rather longer
than I have Ever seen them. I regret I
cannot serve you with greater accuracy
in sending fruit from many places, ~~[illegible]~~
~~[illegible]~~
~~[illegible]~~ I am
compelled to await my chances for getting
anything as I may happen to visit a
place when sent for. But I have seen
very many plants of No. 2, — 10 & 20 miles
apart — always same Except that in one or
two instances I've noticed a shorter leaf.
Spine always strong & base of leaf always
much attenuated. This is ~~quite~~ always
the case. . Nothing more as yet
to say of worm of Y. al. Can't find any more
of reddish-green bellied larv. but the rind of
some fruits full of the little white worm —
with as yet no legs ⬮. I however think
he's growing — will he yet run into the
other? Send by this mail package of No. 1
& No. 3 (last) also one or two of fruit
of Y. al for you to Examine the
Pulp worm — also spec. of Mistletoe
from a young persimmon (Diospyros) about
6 feet high. So far as I have as yet
observed, the ^plant^ ~~[illegible]~~ ~~[illegible]~~-springs from the younger
limbs of a tree about 3 inch in circum. — or
rather they are now growing on such — of course much
smaller when the seed "stuck". Mostly seen ~~[illegible]~~ on
Quercus Laurifolia a tree of rather smooth & as rapidly

Decaying or rather easily injured by gales. I've seen trees on Daufuskie Isle near the

ocean with seemingly more mistletoe foliage than their own — they then seem

Rec'd Aug 23 1872

92a

1) The package sent contains seeds &c of No 1 in the "Saturday Review", seeds &c of No 3 in brown paper. Scape &c of young & rather stunted plant of No 3 – showing the very young buds enclosed in the intricated scape leaves; – far from being a vigorous plant. Longish capsule of I believe No 3 from "Cemetery 7th" of last year, wh. please compare with yr Y. P. I strongly suspect this last & my No 3 to be identical: you will tell me what the seeds say. Also the original Y. al. young "banana" from wh. my drawing was taken of the half formed worms (?) showing the excavation in the seed-lines from wh. I took them. These wd I think have run into the reddish-green bel.

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larva sent you in phial. The little bits of tissue paper contain three *dried specimens*, — don't you call them now Yucca seeds wh *have* intended to mature — the others being imperfect! — for I cld hardly stand that !! Also another, softer & undried specn of Y. al. fruit already split, with a worm within, wh seems to be developing, — mayhap into the other. Did not extricate him from his pit where he was busy head fore most eating & digging! — fearing to hurt him! Please ex-amine him. The egg of these things must have been deposited right in & among the seeds, ~~they not~~. But on the other hand I have a splendid *head* of Y. al fruit with long symmetrical pendulous fruit (some 30 or more) with perfect intact seed & no mark of insect without or within on most or all. Who can read these things?

Rec'd Aug 27
Ans Sept 30

10

Bluffton Mo
20 Aug '72

To – Dr Engelmann –

My Dr Sir,

Even at the risk of some repetition & possibly "boring"* – I think it best to continue to write as long as "the Yucca season lasts" – because "the night cometh wherein no man can work"!

In a former letter I stated that I believed the seed eating larva, found in Y. al. was identical with the seed eater of Y. fil, & had much to say too in connection with other matters appertaining thereto, such as the fecundating moth herself & the possibility of her ovipositor being thrust thro' the tender capsule either of Y. fil or Y. al, & therefore the possibility of the impregnation occurring by some other agent! At the same time I sent you in another letter a little phial containing

* Do I intend this as a pun, as my letter is of borers?

In the case of these two larv sent, "saw no trace on * the rind whatever to attract my attention to the seed eaters within – they seem" to have been born right in the seeds, & yet in one or two other cases at least I followed the track of puncture from without within!

4 larvæ — the two below being from Y. al. — the two above from Y. fil. (no 3) I trust you recd them & ~~&~~ have long since compared them. In my next letter my high tone was considerably lowered, because altho' I cut up a great many "bananas" of various shapes & sizes I could not find any others! In all I believe I ~~found~~ found some 4 ~~[illegible]~~. I remarked also that a great many larvæ ~~&~~ were to be found in the Pulp — of much smaller size , — very white, & fat, & without legs — altogether difft. from the reddish cold green bellied ones which were eating seed. Now since my last letter I have cut up & sliced a good many others & to my great delight succeeded once again in "striking ile"! — ~~but only once~~ or rather twice — a worm in each fruit. I sent them to you by this mail so that you may see the kind of execution they are capable of doing in those very hard black seeds. The two large ~~gr~~ greenish worms (for they have now assumed a greenish colour about the head & back of that peculiar colour wh in old days one wld see in the trickling grease

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of an old hags a copper Candle-
-stick — ~~[illegible]~~ ! I am
thus particular as the colour is
peculiar.) I say the 2 large ones
are from the ~~the~~ fruit sent
— the others like little dwarfs of
Fat are those (very diff.) wh.
eat pulp & not seed! & wh.
are to be found abundantly in
most bananas"! You will see
now the proportions my smallest
reddish larvæ have *now* assumed,
& I am more than ever *assured*!
of Y.f. & Y. al being one & the
same! Same colour, — same
no. of rings, — same no. of true
feet, (6) & others rudimentary (?)
When I found these fellows they
were *in* a sorry plight — "water,
— water everywhere — yet not!
a drop to drink," — simply
because they couldn't drink!
In the "slough of Despair" were
they! — sunk deep in mud —
so tenacious & *gummy* that
they couldn't move & evidently
they had given themselves up
to die, when I released them;
but they were very sluggish & did
hardly move — indeed at *last*
gasp when I dropped them

10 in alcohol for preservation! Doubtless as long as the fruit is on the bush, they cld have eaten, everything being fresh & juicy, but not so after the partial drying of the Cap.

But strange that I find so few! & on ~~a~~ ~~many~~ some fruits long & symmetrical I can find no trace of puncture, abrasion or gnawing — within or without. Is it that the moth Pronuba is tempted by the similarity of the flowers of Y. al to Y. f.ᵃ to deposits her eggs only in a few instances?

But I will try & look further & discuss these things on another occasion. I only write this in the greatest hurry so as to accompany the package wh I wish you to get at once. my pen too is most wretched. Sent package again last mail.

Yours truly

21. Aug.

Recd yr long & most interesting letter — many thanks! will answer at the right time. Stamps too? I devote them to the work of your Linné as well as I may!

In the case of these ~~two~~ last sent, I saw no trace on & the rind whatever

Rec^d Aug 31 1872
ans Sept 30

Bluffton S C

26. Aug '72

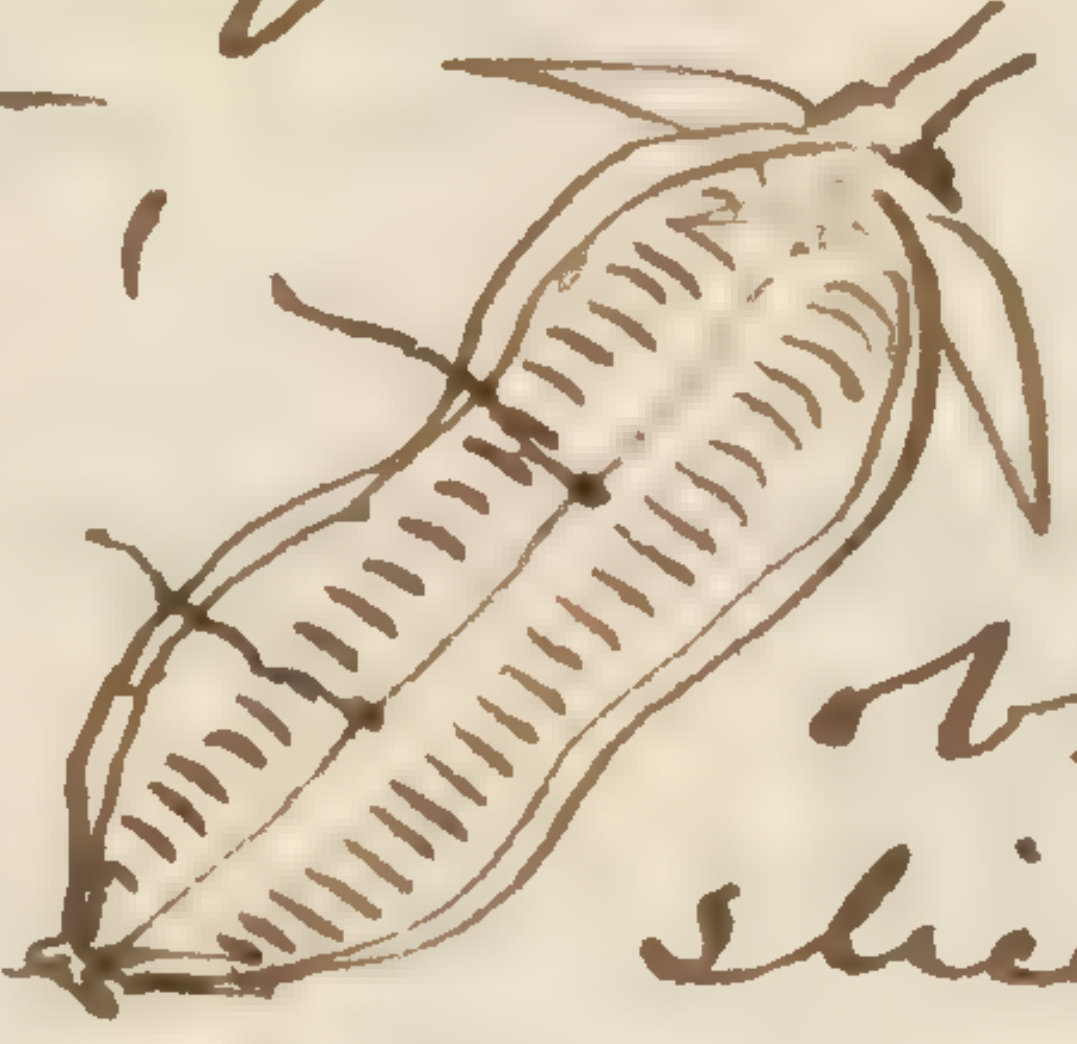
To Dr G. Engelmann —

My Dr Sir

(yours) As stated in my last, ^ of 11 aug had come to hand, — and now another of 19 aug with its rich cargo of Yucca goods! You are very good & you have my hearty thanks! — Now let me say Almost thou persuadest me to" believe in Pronuba, which I shall do when I see the larva turn again into the moth, & when I feel better satisfied that these punctures on the surface ✗ & these tracks through the pulp of Y. al. are made by some insect wh has no connection whatever with the reddish col^d larva that eats seeds! There is then no doubt that the moth crams in the pollen because it has been seen to do so, & therefore an agent, or one of the

agents in impregnation, but it is
not yet *proven* that the larva is
from the egg of the said moth, or that
in egg shape it was not deposited
within by some insect wh pierced
the capsule from without! Now mark
you! I am almost sure that the larva
will turn out to come from the moth,
^ that the punctures on the surface of
the fruit of Y.al. *may* have nothing
to do with said larva, or said moth;
still, what I observed is worth looking
after. *For* in one or two instances
I *did* trace the larva step by step,
or rather slice by slice, from the mi-
-nute puncture on the rind, through
the white pulp – immediately to the
seed in wh he was tunnelling away.
On the other hand
^ In examining the surface of the
capsules of Y. fil I could see no marks
of puncture ~~[illegible]~~ (I mean punctures
from without for the purpose of intro-
-ducing the ovipositor) ^ now again
after examining a *large* number
(I find ~~[illegible]~~ some)
of Y. Al ^ having no punctures at
all, ^ no worms of any kind; either
in pulp or seed! — others with only
the little pulp larva (cynips) in great
abundance; — a great many with
punctures (*nay* most of them), and which
punctures after being carefully followed

slice by slice, with the expectation on my part of unearthing a tunnelling larva in the seed,— end in,— nothing! neither egg nor larva! I follow them ~~in~~ generally ~~variably~~ to the central line of the fruit, & this in repeated instances.



After getting to this centre you still observe the little green spot,—cut a thin slice still deeper & you've lost all sight of it forever! There is no doubt that this puncture is the work of some insect when the cap is very tender & green, but whether it has any connection (as I at first supposed) with the larvae seed-eaters—is more than I can say at present. In my last two instances when I "struck" the larvae eating in the seed,—(or rather half dead, swathed in their gummy débris as I wrote you—!) I did not trace them by any puncture from without—I came upon them unawares.—So that you see my chain of connection between the puncture & the [illegible] larvae is broken, & I may not mend it!! — Now what does this prove? It proves that I may have erred in my supposition that the larva seed eater came from without, & not thro' the stigmatic tube, & that in those instances where following the rind-puncture I came upon the seed-eaters—it was simply accidental,—that is, the larvae were placed in the seed originally thro' the stigmatic tube, & this puncture from without by some other perhaps quite diff^t. insect from the moth—*only happened to* strike down upon the *spot* where the seed eaters were busy at work! I mentioned to you *one* case where the larva seemed to have hatched just without the seeds to wh he had made his way. It is possible he had been originally in the seeds, & by way of diversion had tried the pulp for a while;—but when found he was in the seed! ——

You refer to my contradictions—one letter stating that I was *not* able to trace the tunnelling worm to an outward connection, & another, that I *had* done so by following the "greenish or brownish mark" from the puncture to the worm, & you ask how do they "harmonize". What I've written explains therefore that I've seen both these conditions. I enjoy this advantage—that writing only on the spur of the moment, & *from what I do see*, I am enabled to *correct my hasty conclusions* next mail or two,—whereas, the great Mr Darwin—whom most worships, but whom I'm disposed to look upon by the bye as the most inconclusive of all writers (*Is he not a HUM?*) has to wait for succeeding editions to correct *his* mis-statements & inconsistencies! I wonder where he'll be 50 yrs. hence?— I wonder!—perhaps quite forgotten. "*Our little systems* have their day,— They have their day, and are no more"!!

Rec' Aug 31

(2) I hear you say "Please keep to the matter in hand, & be so kind as not to fly off at a Tangent!" — Bien!

But after all — as you see, I still feel uncertain as to these things — Nature requires patient watching, — her secrets not to be revealed in one day or two, & many investigations are necessary to verify any one fact. For my part I do not at all doubt that the larvæ of Y.f. & Y.al. are the same, — the great thing is to be satisfied that said larv came from the moth.

Yesterday a negro brought me a head of Y.al. with fruit, — they were small — inferior & twisted. I cut up every one. I found only 2 or 3 pulp worms, & not a single larva seed-eater, — so that you see after repeated examinations I've yet come across not over 6 — (possibly 8) reddish col^d larvæ! Query! for there is no end to the wonders of nature & that everlasting battle wh is [illegible] ⇒ being waged as furiously among the "small infantry" of creeping creatures, as that (alas! alas) wh was waged between Germans & Frenchmen!! — Query! may not in all instances the eggs of Pronuba be deposited

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^ some keen scented enemy — some delicately mouthed egg-sucker — gently probes* each tender capsule for his dainty food? *Hence the repeated indications of Puncture. The Yankees probed my yard all over with keen ramrods ^ bayonets for hidden gold & silver, — The **crow** (fish crow) & the raccoon dig up the eggs of the salt water terrapin on the beach, — why not the same process go on in yucca? It won't do to pull such a bow at a venture as that will it? — facts — facts we want! As regards those ants, — do you know I have asked myself whether our Y.f. larva would not always remain within his capsule (as I did find two somewhat webbed up in one) ^ whether it was he that did the boring out, or — the ants boring in after him? But your saying that they bored through the green capsule ^ even the paper wrappage — looks as if they must come out any how! —

I cannot answer that question as to how many seeds of each kind (Y.f. or Y.al) will a worm require for his development, & shall endeavor to watch Y.f. to verify that "bold" thought of yours as to impregnation of the late bloomers! Unfortunately the plants are not very near me

& I must depend on my chance visits in a measure when sent for! Unfortunate!! I have no Capsules from Stiles Pt or Ft Motte, either of last year or this,— but have written urgently to both places. It is hard to interest ~~the~~ profanum vulgus in such matters, but I know my Father will get them for me if he can. I'm getting to think it's a pretty hard matter to "locate" Yucca—! illusory,—elusory,—Evanishing Yucca! But, if I can't describe the variations in book lore — I can walk in a field & pick 'em out at a glance! — I can do that if nothing else!

I agree & heartily to Ys 1.2.3 & 4, but I think it likely "flaccida" will come under "latifol." your "Y. Pub" under "Y. Brac"! What say you! never in all my wanderings saw a Yucca fil trunk like the one figured,— never saw the faintest effort to push out shoots & branch! Something wonderful to me. Reminds me of a stunted "gloriosa". The only 2 that pretend to make a trunk of a few inches are 1 & 4, (& always renewed by subterraneous caudex — in no other way—! Examined for this at Ft Motte & here. And are the ~~s~~ seed markings going to fail us too?— my last hope! Mr Riley's figures of Pronuba &c are beautiful! — you certainly are "fast" people out there, & &

& up to time! They seem to me to be won-derfully accurate. I am going to send them to my Father, having asked him to try his hand at the fecund. of yg — if they bloom this yr. I suppose some 25 or 50 bloomed there last yr but no fruit!

I am much indebted to you for yr kind-ness in sending these things to me, & now my dr Sr. I don't think I shall bother you with another letter until I've got some fact or other to present you with for I can't inflict windy talk on you any more. Very truly yrs C. H. M.

Bye the bye had a very curious dream in connection with yrself — doubtless due to my having the day before hooked down a P. Ell cone of pe-culiar form to send you! I dreamed I recd a large package from you thro' the mail, con-taining immense cones with immensely long leaves — with this note, "You boast much of yr long leaved australis & the specimens it makes, but here is one wh overtops anything you can bring. It is from Nootka sound, — called the Nootka Pine! — please observe the 10 fellows in each sheath, wh appear in last yr's growth as well as this!" I asked myself what "fellows" meant, & concluded that was a new name for leaf! Can't you send me a specimen & make me a believer in dreams? But after all this may be our Realest life as it is sometimes our best! ~~[illegible]~~

"We are such stuff as dreams
are made of"

PS The Arch of the tunnelled seeds sent (y. al) had to be broken in (cut) so as to extricate the prisoner!

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P.S — Rec Aug 31 1872 2 day — 3 113a

I neglected to say that if any thing interesting occurred Entomologically I wd endeavour to oblige Mr Riley — & indeed I may say now that that for 2 or 3 yrs past I have observed with some interest a certain ash-cold villainous looking insect wh devours, in a very short space of time shrubs of Ilex ambigua & I. Cassena (yaupon). It is singularly voracious & restless. I might amuse you ~~by~~ were I to tell you how my attention was first *attracted* to this "wry-necked beast"! Happening to pass through a clump of Cassenas, I stopped for a few minutes & was attracted by a peculiar sound, like a continuous dropping upon dry leaves! Supposing it to be *drizzling* — I looked up at the sky, but the sky was cloudless, — considerably puzzled I did not discover the cause until I observed the Cassenas covered by multitudinous hordes — wh were either eating, — moving, or flying in every direction, & it was the chipping of the leaves & their incessant *excremental dropping* ~~upon the to~~ wh caused this peculiar sound. I have never seen them upon I. Opaca — or Dahoon, — only on the above. The curculio (?) also wh punctures *almost every* acorn of *Q. Virens*, or another wh performs the same office for the bony seeds of the Cabbage Palmetto (Sabal. Palmetto) may also be of int. The Nephila Plumipes also whose silk *was* to *have been* wound by the "deft fingers" of the* dusky daughters of the S. islds — *thereby superceding S. isld cotton* — 16

* see old nos of Atlantic monthly by the discoverer Wd Wilder! —

3b

to be found here, their amber col^d webs stretching *from* pine to pine! No danger myself of my attention being distracted from my more *legitimate* duties of Plants to a study, for wh. I have but little taste or inclination, — nor indeed time; — besides, there's the risk of a man's running into the condition both physical & mental of the "*Scarabee*" so genially & humourously described by that Master W^r Oliver Wendell Holmes in his "Poet at the Breakfast Table"! Such a beetle like condition w^ld hardly be pleasant! — and that reminds me that in the last No. of Atlantic monthly for September there is also another piece in quite a different style — on a *subject* kindred to us both, viz, "*Aspects of Pines*" by Mr. Hayne, who, I'm glad & proud to say is a *Charleston man*! Now you are studying Pines from "*Nootka sound*" (Sitka?) to Van Dieman, & not the faintest variation of leaf or cone or bark escapes y^r eye, ~~but~~ this is the mere material form & outer husk of things, — but if you would catch that more subtle essence or spirit born of form & colour wh. pervades a solemn Pine-forest — I pray you most humbly to look at *this* picture from the hand of a Southron, — native, & to the manner born! your correspondent who standing on his own heather claims to look at all such "aspects" with open eyes — indorses this Vates as the interpreter of his own woods & forests! Am I overbold & impudent — or only tiresome?

When may I look for Pinus Nootkiana & shall I say P. Dicemfol — ? ——

Trust you've by this time rec^d my full grown larva of Y. al. (in phial) & also the tunnellings of same!

Bluffton, Mo

Dr Engelmann 29 Aug/72

12

Rec^d Sept 3^d
Ans. Sept 30

My Dr E.

I had hoped to give you a long breathing spell, but as I now have a "fact" — tho' a small one — I present it to you at once. Last year I thought that Y. flaccida bloomed only in the fall — 1st because I saw it in several instances, 2^d because what I saw corresponded with the statements of those who could be relied on. What was my surprise therefore (& I may say deep regret at an opportunity lost) upon visiting my patch of No 3 to find that a plant of Y. flac * some few yards off had already bloomed & from the dried appearance of the stalk & the condition of the

* hidden by a screen of young black oaks, or I might have observed it!

12a flowers — Evidently in July or
perhaps when No 3 was in
bloom. Trunk 8 - 12 inches & stalk
5 or some four feet — precisely like
those I figured for you last _fall_.
It must have flowered abundantly
but _of course_ no fruit! What an
opportunity lost of trying my hand
at the impreg of the flrs — & most
likely it was in bloom when Examining
No 3. wh was full of _Pronuba_, why
could they not have fulfilled the
same office for Y. g? This plant
of Y. g. was the one from wh _yours_
came wh I sent you. When I last
Examined this plant — it was in May
I think, — Earlier or later, but no
Signs then at all of putting forth. By
this mail I send a leaf & flrs
from same, but doubt you can make
anything of the last. — also seeds
& cap of No 4 from Ft Motte just
as my Father sent them whose
letter I enclose. ~~Of course~~ as it will
save me the trouble of writing & will ex-
-plain better. Of course all the cap. are
of No 4, ^ my Father is mistaken, by far
the greater part of the plants on his
lawn ^ wh bloomed last yr are _Y. glor_,
only a few Y. brac (al). Doubtless his
Parish duties have prevented his giving attention
to these things. When _you read_ his note
please _destroy_ — or return as you
please. My long absence an error —

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13

Rec. Sept 27

Dr Engelmann

My dr Dr

Bluffton 23 Sept. 72

lately examined several capsules of Y. Aloifol all of wh. were bored by the larva making its exit — indeed but a few days since I recd a whole panicle of fruit & I believe there was not a single one un-bored. By this mail I send 2 or 3 "bananas" in proof of what I've stated — if you cut down to the seeds you will find their tunnellings. I judge that from 10 to 14 seeds generally are eaten by each larv before he escapes. Evidently the moth performs the same functions in ~~many~~ some instances for Y. al. as in Y. fil.,

I sent Mr Ravenel specimens of young pines (1st year &c) of P. australis with notes as to their peculiar growth &c he states that he had not before observed it. Strange that I can find no cones of this spring. I cannot well understand it — for, of the thousands of pines I've looked at. They are of course of all sizes & ages. & therefore even tho' each tree does not bear every year one ought to find many trees with young cones & many with cones maturing this fall — whereas I find only the latter!! So as I said there was no mast last year — an abundance this year — but so far as I can see there will be none again next!

(2)

13a

But perhaps not in all — possibly in only a few(?) As for the pulp worm — by Examining my now soft capsules I find that it has made its winter (?) home within apparently some tender or decayed seed. After being ensconced the seed looks like a little soft pulpy bag. I have found a great many of them in those capsules wh from previous Examinations I knew to be full of pulp worms.

I have not yet seen a single Y. glor. in bloom this fall — but my Father writes me that one is blooming now on the lawn near him He will attempt the fecundation he says. With the Y. al sent I enclose also a cone & of P. Ell from a sapling some 30 feet high.

Within this note you will find L. Catesbaei (half opened) & a mutilated specimen of Habenaria Michxii wh I dare say you have never seen — Curious to see these orchids growing in the dry sandy soil under scrub oaks & Pines, but then they have a watery tuber. In the small package of dried plants I purpose sending you will find a good specimen.

I dare say you've by this time rec'd all of my packages (another phial with full grown larv of Y. al.) & letters &c Yr truly & resp'y E.H.m

It is true the young cones of P. Aus are well concealed by the long leaves — but I found but little difficulty in discovering them last yr. in getting some for you!

Rec [illegible]

Ans 30 Nov

Bluffton SC
4. Oct 72

To
Dr Engelmann

My dear Sir,

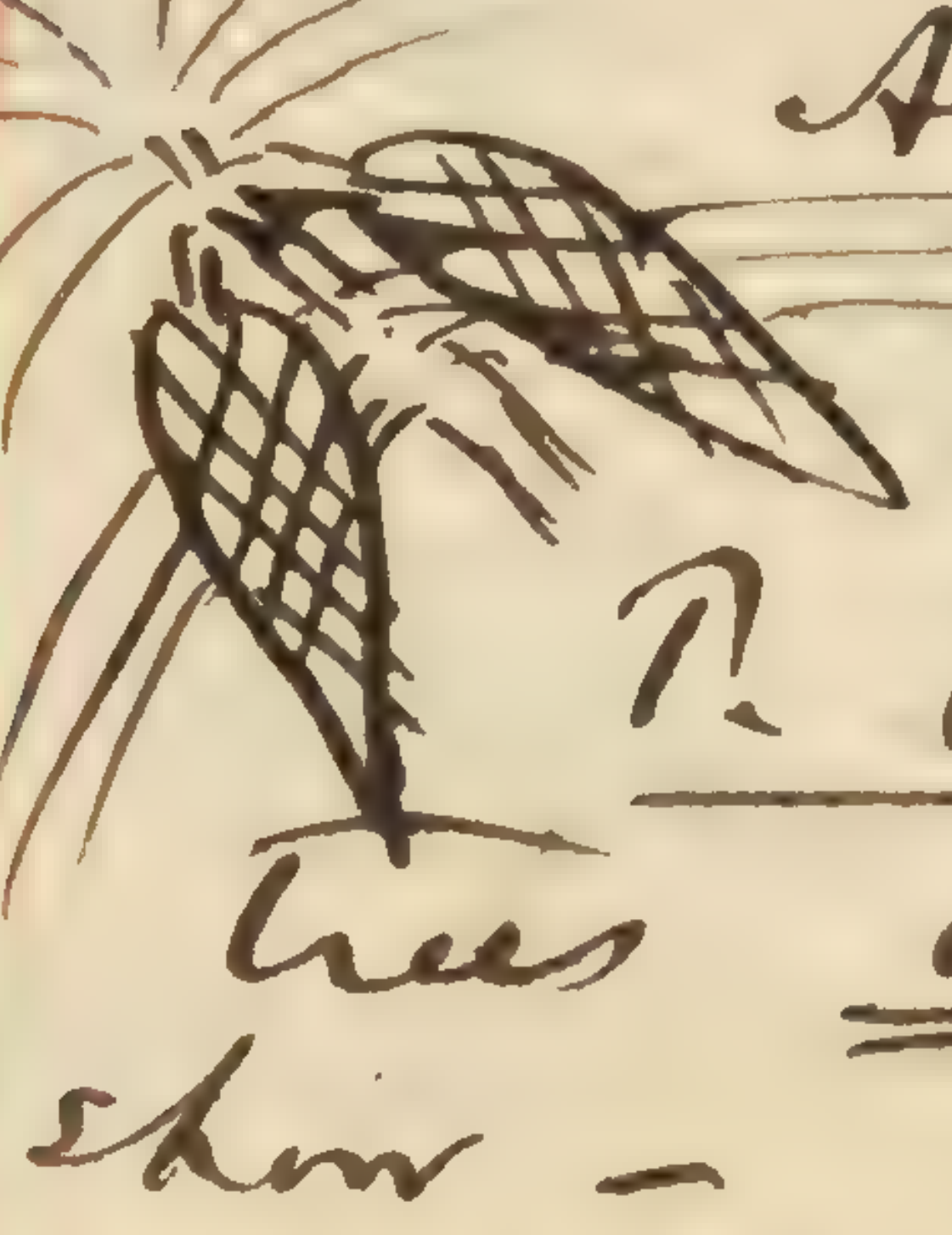
No gloriosas have bloomed about me this fall, but having within a few days past rec^d a flower stalk of the same from Hilton Head Beach — I've thought it best to bundle it up to take the air of Mo! A few flowers were rec^d at the same time in a little piece of dirty paper — I conclude from the same stalk, & these also I send. This was the offering of an old ante bellum patient of mine, — a negro, — who made a faithful Summer & — wonderful to relate — kept it!! — So you will value it accordingly!

In the same package also another cone of P. australis, & possibly — if I'm not too much hurried with a certain troublesome case a bulb of L. Catesbaei & tuber of Habenaria

As before stated many cones of P. serot. seem to delay much longer — for years perhaps!

I again state that here they never open till after July of the third year. Certainly the early bursting of the cones of P. Ell. separate it from all the others.
Very truly & respy yrs
J.H.M.

mickii — others of Bletia aphylla.
I enclose in this a few seeds of
Magnol. Tripetala, — a beautiful cone
of wh my Father sent me from
Ft Motte. It was very fine, — smooth
& waxen in appearance, & the colour
rose-colour, or perhaps I might say,
Lake or Carmine. I once saw this
tree in a primeval forest on a S. isld,
but never the fruit. My Father writes,
that the appearance of the tree with
its long leaves, *pike-like branches &
flaming cones — was something wonderful!
I long ago told you that some trees of
P. aus. did drop their leaves in the fall
of second year, but that many or most
carried them on to the 25th month
or thereabouts, & possibly that is always
the case in the year when the cones
do not mature — as was the case
last year; — Now, however, almost
every tree being ~~[illegible]~~ full of cones now
~~[illegible]~~ maturing, I observe the leaves in-variably below the cones are turning
yellow & commencing to drop, — many
have dropped already, & even on some trees
wh have no cones I observe the same.
Above the cones the leaves are still



green — possibly they may hold
on, till spring! The cones of
P. Elliottii are already on many
trees open, & making quite a
show — those of P. aus. P. Tæd. [illegible] Mit
& P. glab. still green & tight. P. Serot. yellowish
but will not open till between July & Oc '73.

* very irregular it is true, but thrusting out at you like pikes.

Recd Nov 2d
ans 30

Charleston S C
30. Oct. '72

15

My Dr Dr

I left word at Home to send you two packages, — one of capsules of P. Pub. — another of dried plants collected from time to time, — chiefly Orchids &c.

Doubtless you have recd them. As for yr two last letters they reached me in due time, but I was then & had been for some time in such distress & perplexity on acct of the illness of my dear father, & I unable to reach him on acct of cases wh. it seemed impossible to abandon (with but little help near) & wh. needed the most exact & judicious attention! Was it not hard — hard? — I was therefore utterly unable to answer! When I did reach St Matthews, he was no more.

Time of course brings its assuagements & alleviations & the "shock was full ripe" — he in his 74th year; but it seems now as if this terrible gap can hardly be filled again in our little Home circle, & that Life can hardly again be quite the same thing to us without the presence & encouragement of this most genial — & most blameless of all men. I laughingly t'd him in my visit to him of last winter — (the recollections of wh. are now to me among the most delightful memories of the Past) — that he was "bound" to get to 90, — at least 80, — so hale, so so vigorous, in mind & body was he!

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for in his whole life hardly had he known
the sting of pain, or sickness! He ~~Sm~~ smiled
somewhat doubtfully at my prophecy, & seemed
quite ready to take whatever the years had
to bring — either Sun-shine or storm, for
there was not a trace of cant in his
composition, & he always possessed keenly
to enjoy whatever there was of good & pure — which
Life could bring him: Above all did he have
that wisest philosophy of extracting enjoyment
from the little things of life! — of the Past he
thought not, — to the Future he looked only
with hope, — the Present he enjoyed, heartily
thanking God for many mercies.

Is it not strange that I should be
writing thus to a stranger (?) — one whom
I shall never see! & yet it is a down-right pleasure to talk of him & I feel
as if I could proclaim his goodness &
his virtues to the good, — the just, & the
refined Everywhere. I could have ~~wished~~
wished all good men to have known
him & loved him! It was but a short
time before his illness that he wrote me
a delightful letter brimful of enthusiasm,
& his genial — kindly humour, — telling
me of a certain walk through the autumn
wood — to "the four rivulets in the gorge",
when he had made the to him wonderful
discovery of a large & beautiful Magnolia
Umbrella — the beauty of wh. seemed greatly
to strike him. The large leaves, — the rose-coloured cones, — the peculiar branches, on
all of these he discanted, at the same
time sending me through the mail a

Rec Nov 2d 1872

cone most carefully wrapped & directed, - some of the seed of which if I mistake not I sent you when last at Home. After his burial while on my way to the Depot (never again expecting to return) I strolled alone through those scenes he so loved, - & struck the path which lead to "the four rivulets in the gorge", & after a little search there stood in its autumn beauty the tree of which he had so enthusiastically written & whose measure that accurate eye had so carefully taken! It seemed to me near forty feet in height, its roots nourished by the little stream, - its long broad leaves just a little touched by the mellowing season, but the ruddy-flaming cones were already black with decay & falling to the earth. But he was not there, — he who was to have been my loving guide to these glories of the wood!

I esteemed myself so fortunate in finding it, but I was glad to hurry away - overcome by my tender & delightful recollections of the happiest days of my life which I spent with him last winter. And yet these things will be, - must be! — but doubly happy the sons who have had such a man for their Father! The Y. gloriosa I found not very far from his door, - the fl. stalk dried & withered & but one weather beaten flower still clinging. - no trace of any fruit & I know not whether he ever attempted the fecundation as he had promised! — he was very near, but his lips could not answer any queries I might propound him.

When I have time again I shall endeavor to answer your letters, — before I came away I hunted for the Azolla Caroliniana & was unable to find it — I had never seen it before. Be sure I shall do what you wish if I succeed in getting it. Pardon myself what may under the circumstances seem so amiss in my letter — but some things make the whole world kin — no matter how separated by distance, or thought, or custom, or race, or belief! Please destroy it at once & believe me W S R
Very truly & resp'ly

P.S — As near as I can recollect I sent you —

Habenaria. Michx
Lil. Catesbaei
Polygal. cym
Eryng. Virg
Scutellaria. Pilos?
Sageret. Michxii.
Sarracen. Var.
Scut. Mantiw
Podostig. Pub
Asclep. Obtusifol
" Verticill
Liatris odorat
" Squar?
Orchis cil?
" Blephariglott!
" Cristat!
Pogon. Divaricat
Dilatris Tinct
Tofieldia. Pub.
Zigaden. glob.
Androm. axil.
Pyrol. mac.

Stilling — Sylvat
Gordon. Lasianth
Thea. Virid —
Bletia aphylla (flrs dropped)
Desmodium —
Convolv. Sagittifol.
Cham. Hystrix
(Opuntia Vul.
3 small ones from seed — & flr
flrs of Y. glor?
Job's tears. (?) (?)
Clemat. Virg —
Hypericum —
Frangula Carol.
Stipa avenacea &c &c
&c
& capsules of Pinck. Pub. !

I enclose seed of Mag. Umb. (Tripet— Michx) found under the tree — also of Lil. Catesbaei. —

Rec^d Nov 20th
Ans — 30
10y

Bluffton S.C
13 Nov '72

Dr. Engelmann

My Dr Sir,

Upon returning home I found that while the package of Capsules of P. Pubens had been sent, — that of dried plants still remained, I therefore mailed it a few days since, — tho' it is doubtful whether they possess any int. for you — as the specimens are common enough, — somewhat mutilated & all in confusion. I have since discovered a change in the Postage law, — I trust you will not have to pay the excess in letter postage. I write now because I thought it possible that the time & mode of germination of the pines have some interest for you. It is now some time since the seeds of Pinus Elliottii have been appearing by hundreds in the dried up ponds & old fields, & this was to be expected from their early maturing & dropping, — now of our P. australis is shooting up & also by hundreds in the sandy pine-land roads. Were you to take a walk in one of these old deserted roads un-

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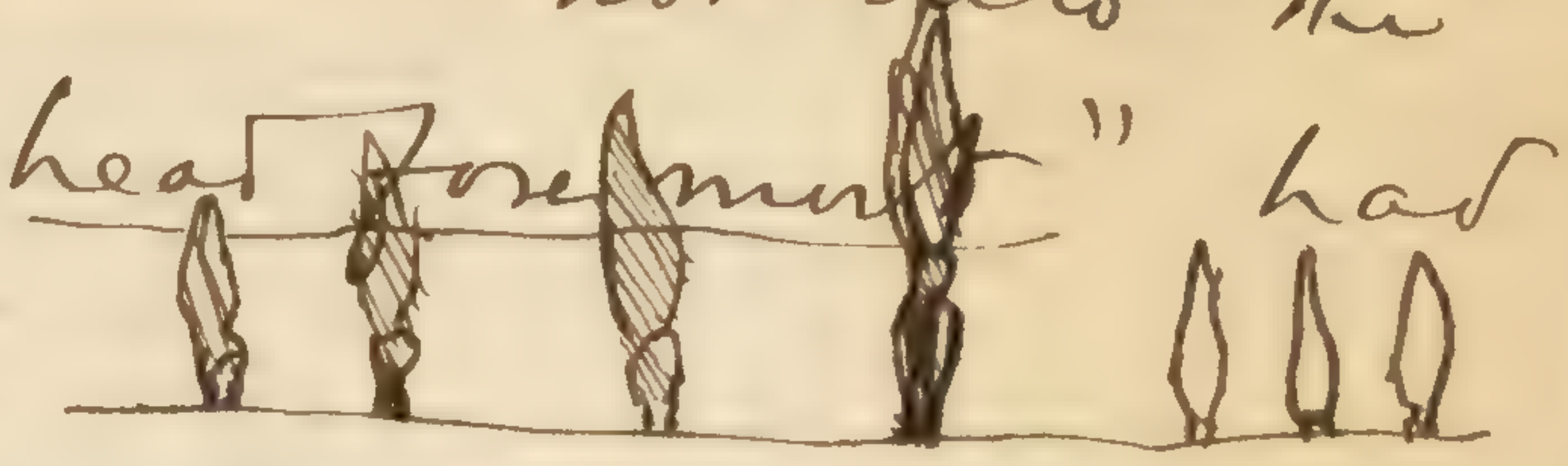
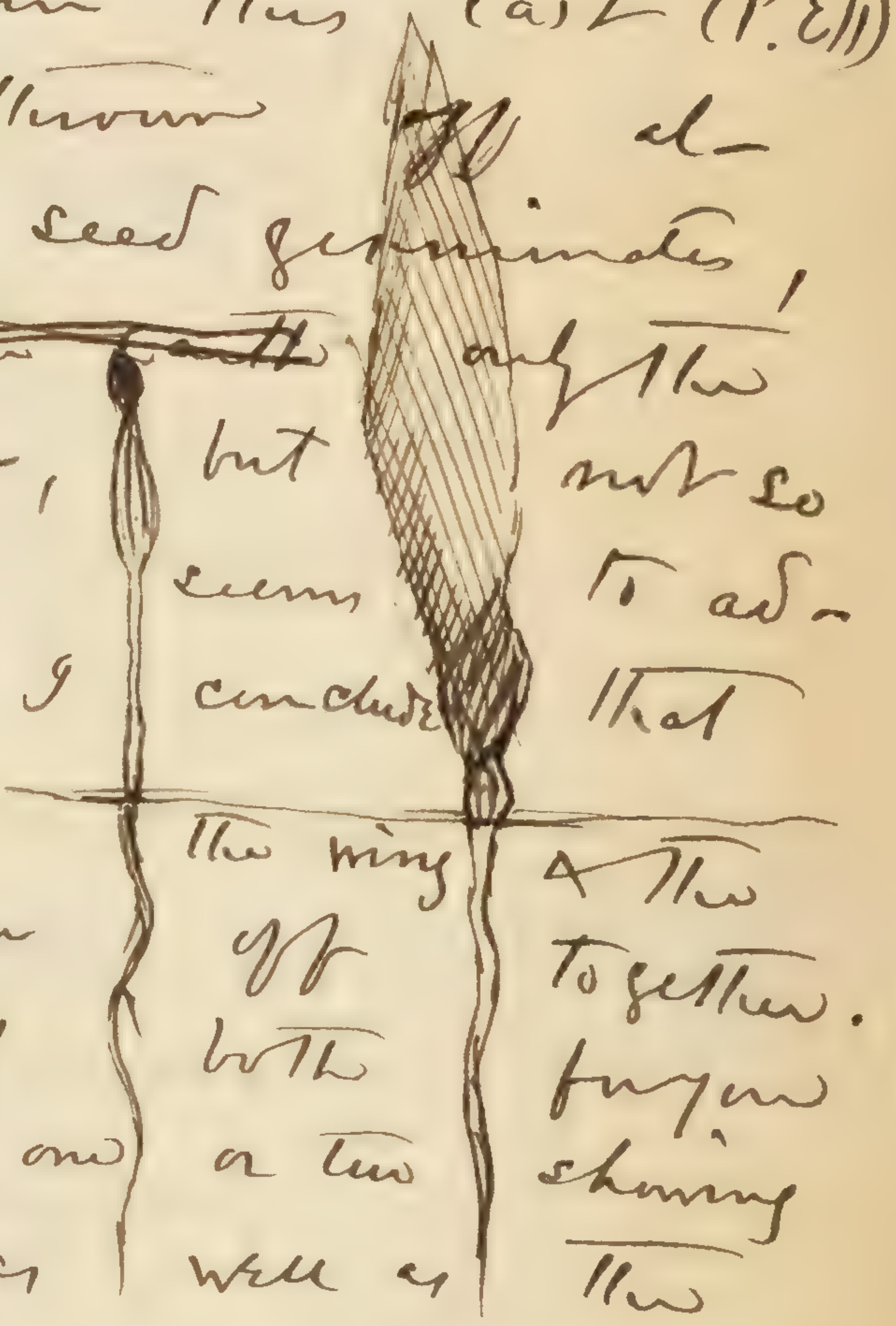
trodden for many a week you would see the road covered with the seeds, as if hundreds of little arrows had been shot into the sky & coming down "head foremost" had so stuck in the earth  !



They seem to germinate very quickly, — more so even than P. Ell; — in this last (P. Ell) the wing of the seed is thrown off al--most immediately as the seed germinates, & when it pushes upwards ~~out of the earth~~ only the blackish grey husk is seen, but not so with P. australis, — the wing seems to ad--here much longer, & indeed I conclude that when the Cotyl. leaves expand the wing & the husk still adhering — all come off together. I enclose different grades of both pines to examine. I enclose also one or two showing the expanded cotyledon leaves as well as the true ones just peeping, & all from the same starting point as before alluded to. As for the number of the Cotyl. leaves — they evidently vary much; with P. Ell, — generally 7 — or 8, — frequently 9, — occasionally 6 (never I believe under that 7:0) — once only I found 10. Pretty much the same I imagine with P. australis but as they are just appearing I have not made many examinations, — 8 & 9 probably most usual. On my way homeward I took Beaufort in my route having business there — & having a leisure hour I determined to visit the old ch-yard where grew those famous "prickly pears" of wh. I've often told you, — They had all disappeared save one clump.

from wh I cut the enclosed spines. I saw no fruit. While on the Port Royal R. R ^ almost within sight of the Town where Elliott so long lived — we skirted a swamp of Nyssa, Populus, ^ Magnolia &c, and among these I saw towering up a very fine Pinus glabra, — its thick branches with dark green foliage contrasting finely with that of the surrounding trees, — and I wondered again how the botanist cd so long have confounded this peculiar tree with P. mitis. Our route continued through stretches of ponds & wet ground where P. Serotina assumed a large size, — next a "good sprinkling" of P. Ell, — next P. australis, ^ here & there a P. mitis showing that we had come to clay! So Elliott had them all — even on his own Port Royal! ——— I was also at "Stiles' Point" James Isld for a short time, but for various reasons could make no Examination of the Yuccas there. I was however told by my friends that they had carefully watched Y. glor but that no plant had fruited! They promise still to watch them. By this mail or the next you may expect seeds of P. austral & P. Elliottii. You will find no difficulty in distinguishing both by size & colour, ^ by a peculiar dot on the ~~other~~ anterior surface of seed of P. austral I should like you to plant a few of each so that you might see their germination. Also a few seeds of Stillingia Sebifera collected on James Isld where it is abundant — certainly

16b by this time acclimated. This plant was brought it is said from China by the celebrated Jno. Laurens of Chs'tn of Revolut. fame, — at least so his grand-daughter told me — a daughter of the historian David Ramsay — unless I'm strangely mistaken. You ask about "mast" "pine mast," — Everybody here talks about "pine mast"! — is it provincial? Remember what Emerson in his charming "English traits" tells about the English woman on the Rhine saying, to the people around her "Foreigners? it is you who are the foreigners here, we are English & Natives — Everywhere," or something to that effect. So if we in Carolina say "Pine-mast", — be ye sure "Pine-mast" it is, & must be — for all English speaking people, for are we not αυτοχθονες ∧ the "rest of ~~the~~ mankind" in the U. S mere provincials??! Ah! my Dr Sr — in our intense bigotry & provincialism we used to talk & feel so, but we are a sadder people now & possibly wiser, — only our wisdom has come too late! Mast is something to eat — that can be eaten. ∧ is ~~it~~ (P. mast) not better than acorns? Australians, eat pine mast — why not we? — try that of P. aus. you'll find it good! I've looked for Azol. Carolin — cannot find it here, — doubtless it might have been found in St. Matthews'. & how gladly my Father would have lead the way! for nothing would have escaped his eye — which age had not dimmed! — nor had the natural vigor of his body abated! His loving & youthful heart kept all the springs of life in motion. — "on a l'âge de son coeur" "Nevermore" is written on many things in our life! truly yrs EHm

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ß Gent. Elliottii & Thea V!

17

Rec Dec 17th
Ans Jan 8th '73

BluMont TC
12 Dec '72

Dr G. Engelmann

My Dr Sir,

Yr very welcome letter of 30 Nov came in due time & you have my thanks! I thought the sooner I obtained the specs of G. Ell the better — so having but little to do to day for the sick I sallied out into the ice & the sleet — glad eno' to get away from my light-wood fire; — so I fancied myself a real Norse-man for the time being meeting with the "frost demons" &c &c!! Ah! you shd have seen my trees in their new garb, the stiffened leaves

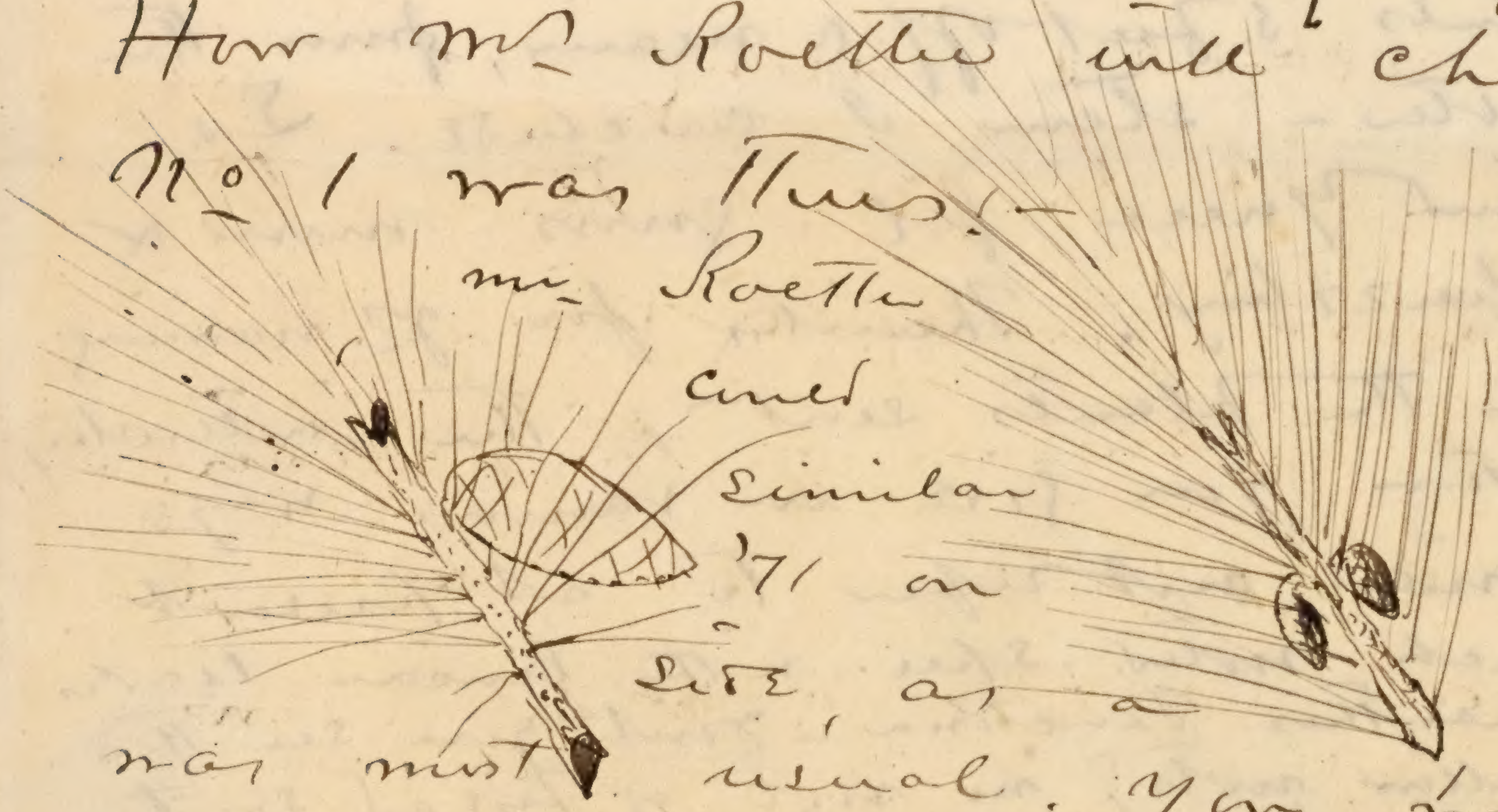
But I ever send you seed of Canna flaccida! — grown in a bog bountifully near me — flrs large — yellow (Quite Moss?) I send seeds, but be sure & scald them if you wd have them grow!!

hardly bending in the blast!
— no soft summer gales now
blowing in their branches! So
you see even we in Carolina
can have our winter too!

I succeeded in getting very
good specn from a goodly tree
whose branches hung over a
creek! — I preferred this to
the more young & vigorous
trees (too much of the sapling!)
as I concluded you wd pre-
-fer an older & well grown
tree. ## Two packages were
therefore mailed to Mr Paulus
Roetter (I had almost written
Paulus Potter — whose cows
in every imaginable shape
& form — "down-sitting &
uprising" I never tired of
looking at some yrs ago — I
wonder if the said Paulus is
still drawing cows? — I think
I'd even change my name
to Paulus — if that wd help

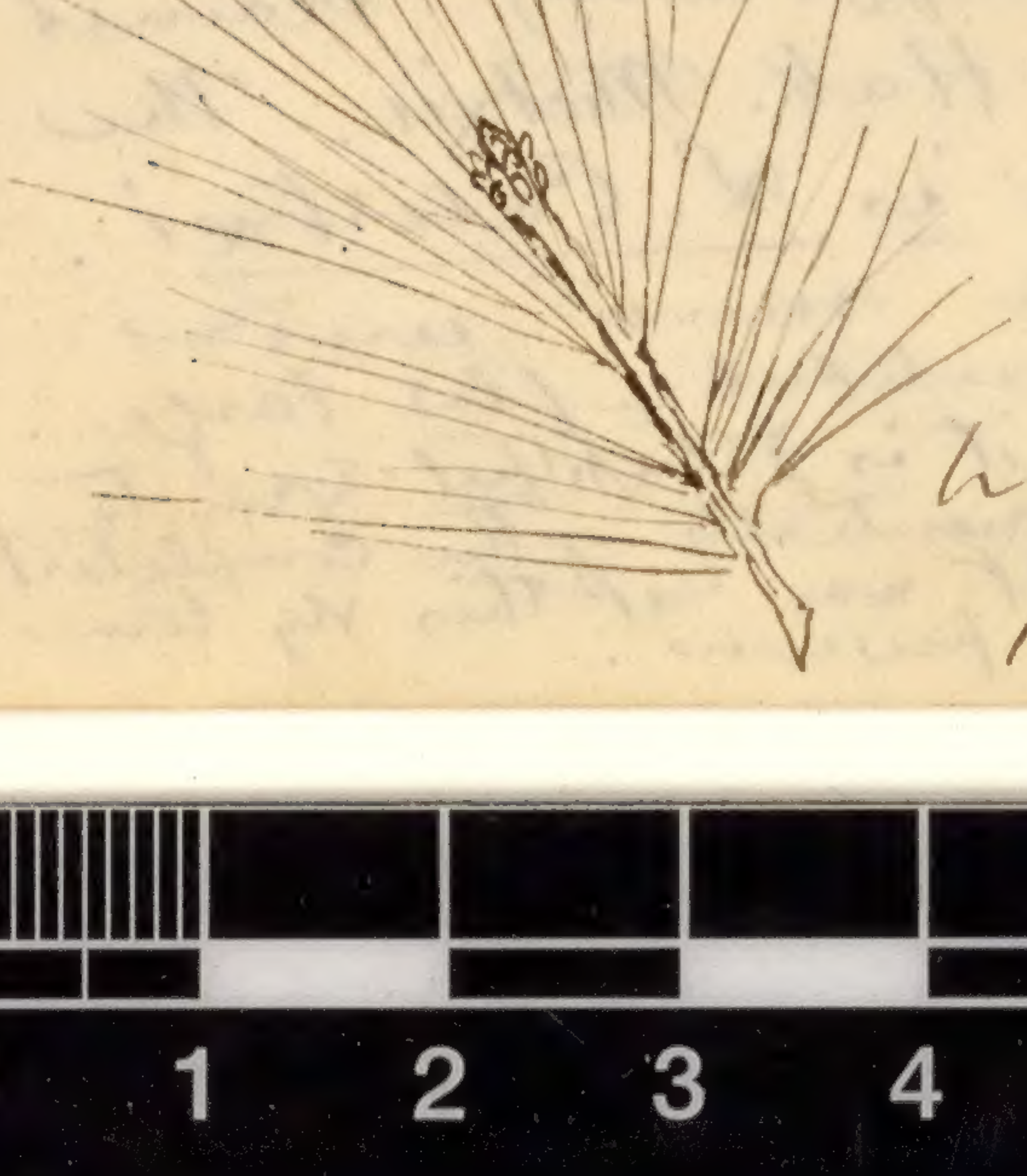
help me to sketch a good Cactus or a pine, — or a nice milch cow!) — well! after such a circumbendibus I return & say that they were mailed with also an Explana-tory letter & even a rude drawing of "how" they grew! How Mr Roetter will chuckle!

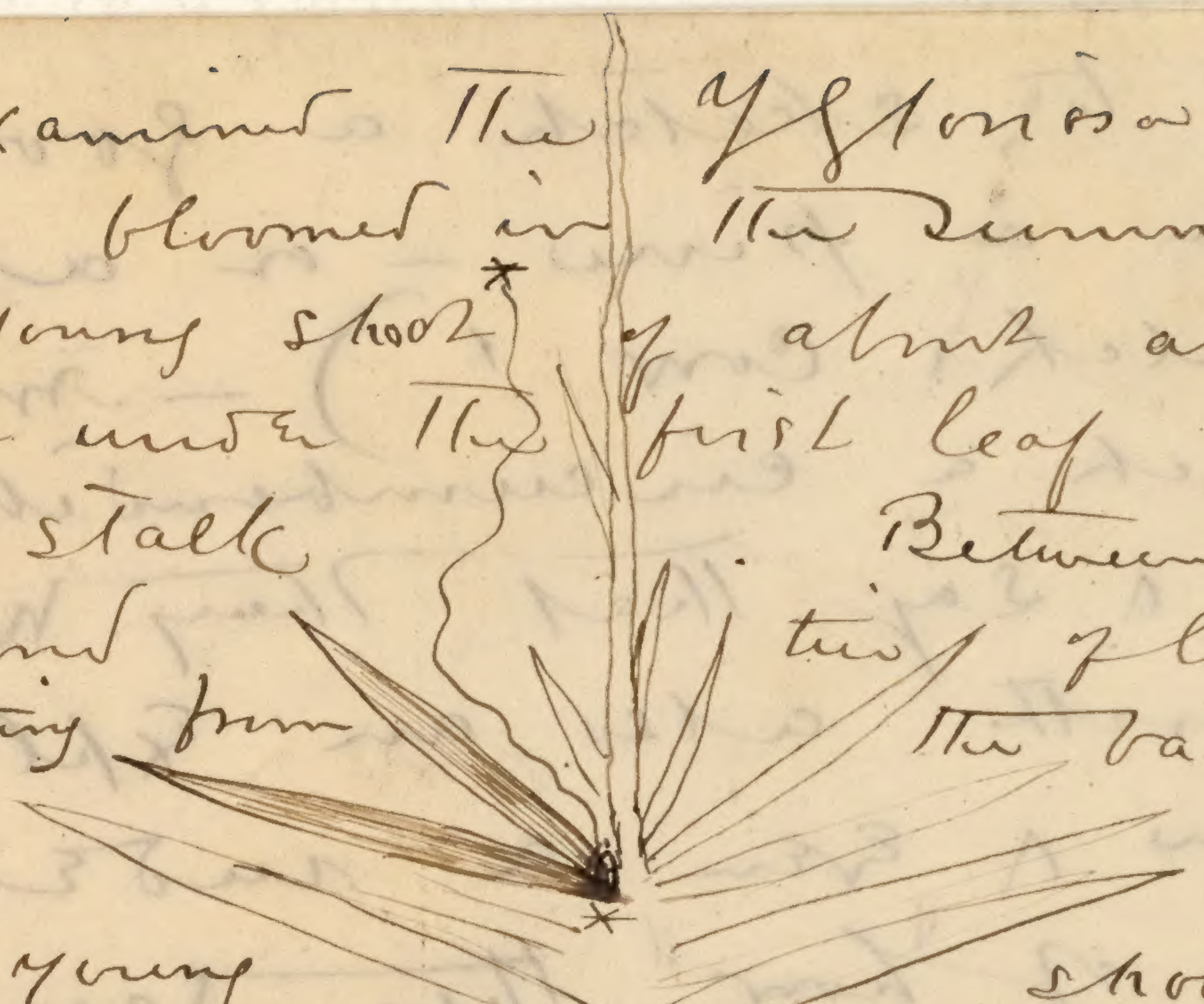
No 1 was thus. — I wrote that he add a cone of the other pair



Mr Roetter
could
similar
'71 on
side, as a
was most usual. You will see that the leaves still cling below the mature cone. ———

The other package contained 2 spec. — one like above without the open cone, & another showing the pushing male aments — already assuming their beautiful violet tinge — thus. I packed them without any twisting or bending, protecting the young cones & aments with softest tissue & I hope that he will receive them safely. ——





17th I examined the Y. gloriosa plant wh. bloomed in the summer & observed a young shoot* of about an inch just under the first leaf from the dead flr stalk. Between the first & second tiers of leaves there – counting from the base of the flr stalk you will find the young shoot. There are young plants 5 feet off & nearer, from the same subter – stem I conclude. So our friend Yucca fil – grows more & more puzzling. Thanks for yr naming certain of the plants sent & the interesting information you give in various ways wh I will not refer to at present. The "much noted spec. with linear leaves is Lachnanthes Tinctoria – don't you see the reddish yellow roots? no root of Zygad sent. The long lin– leaf. belongs to Zygad unless I'm much mistaken, but I've almost forgotten what I mixed up. I did send ~~Prinos~~ Ilex ambig I believe for I have spec. also Frangula. Cant also – or at any rate intended to do it. If my Chinese manipulated C. Hystrix does not suit you, I can send you the whole fam!! Had a terrible hunt after it in a swamp to oblige Prof Gray for M. DeCandolle & succeeded in getting beautiful clusters of fruit – that was over a year ago! – but I wouldn't go into that swamp just now! Foliage of Acerat X fid "quite distinct" from A. Tub.!! where on earth are my eyes? Can't see it – not sufficiently trained I suppose. Globular tuber is Hab. Michxii. The "small thing" with filiform leaves is L. Catesbaei. Bletia aphyll. grows in the rich mould under live oaks about me. – really beautiful – flrs large.
many thanks Dr. S. for yr kind words – it is delightful even to think of another's thinking kindly & reverentially of the completest man I ever knew. The daily loss to me! It was at this very time last year that I was so happy in his dear presence.
again thanks – many thanks. JHR

Package sent by this mail 172ª

containing

Tuber (globular) Hab. michxii.

Bulb. Lil. Catesbæi -

Tubers of Bletia aphylla..

Seeds of Pinus Ell.

" " austral.

" (white) Stillingia Sebifera

" ([illegible]) (wrinkled) Varnish tree (?) - not indig.

" Zigadenus glab.

Sterculia platani folia China

" Agave Virgin - capsules &c.

Dec. 12 '72